2327-

THE

INFLUENCE

OF

TROPICAL CLIMATES,

MORE ESPECIALLY THE

Climate of India,

2327

ON

EUROPEAN CONSTITUTIONS;

THE

PRINCIPAL EFFECTS AND DISEASES

THEREBY INDUCED,

THEIR PREVENTION OR REMOVAL,

AND

THE MEANS OF PRESERVING HEALTH

In Hot Cl[illegible],

Rendered obvious to Europeans of every Capacity.

AN ESSAY.

BY JAMES JOHNSON, ESQ.

SURGEON IN THE ROYAL NAVY.

Non ignarus mali miseris succurrere disco.

——————Study well the clime,
Mould to its manners your obsequious frame,
And mitigate those ills you cannot shun.

LONDON:

PRINTED FOR J. J. STOCKDALE, 41, PALL-MALL.

1813.

Portsea: Printed by T. Gardner,
for J. Hammond, Gosport.

2327
E.
2

TO

DR. JOHN HARNESS, F. L. S.

ONE OF HIS MAJESTY'S COMMISSIONERS
OF TRANSPORTS, SICK AND
WOUNDED SEAMEN,

&c. &c. &c.

SIR,

I BELIEVE You will not suspect me of any interested motive in the present Address, since you well know, how rarely I have mingled with the importunate host —"who crowd Preferment's gate."

But, Sir, I can still remember, after a lapse of many years, the flattering manner in which you conferred on me my First Step of Promotion in His Majesty's Service, when I was very young, both in years

and experience, and when I had no other recommendation than what you were then pleased to term—" prospective merit."

In laying before you (as the legitimate Judge of its deserts) the following Essay, the result of my observations on a subject of no trifling importance, I need hardly say how proud I should feel, if it, in any degree, justified the favourable opinion you so long ago expressed of its Author;—an opinion which, as it made an early and lasting impression on my mind, proved an unceasing stimulus to exertion, and was probably the parent of the present Undertaking.

Since the period alluded to, my destinies have led me far from the sphere of your immediate notice; and it has been my lot to visit many a distant shore,

——— A Gadibus usque
Auroram et Gangem.———

If the present Volume, which you have so kindly permitted me to place under your Auspices, should induce you to think that I have not been a very inattentive observer,

232

3

and that the liberal encouragement and facilities which you afforded me in the prosecution of my Work, were not entirely thrown away, it will prove a source of great satisfaction to myself, while it affords me an opportunity of expressing the gratitude, respect, and esteem, with which

I am,

SIR,

Your obliged,

and very humble Servant,

J. JOHNSON.

Portsmouth Harbour,
May, 1813.

2327
4

TO

DR. JAMES CURRY,

PHYSICIAN TO GUY'S HOSPITAL,

&c. &c. &c.

SIR,

When prostrate on the bed of sickness, labouring under the dire effects of a Tropical Climate, my mental and corporeal powers reduced to the lowest ebb, and utterly incapable of prescribing for myself,—You kindly visited me—you assiduously watched the progress of my disorder, and, under Heaven, restored me to comparative health.

To whom, Sir, can I owe a greater debt of gratitude, than to the Man who so materially contributed to the prolongation of my existence?

If I have avoided soliciting your permission for this Address, it is because, as you generously refused all private remuneration for your good offices, so I was afraid you would decline all public thanks, and thus deprive me of the only means I possess of testifying, with what grateful sentiments of respect

I am,

SIR,

Your most faithful

humble Servant,

J. JOHNSON.

Portsmouth Harbour,
May, 1813.

5

PREFACE.

The following Essay, certainly, is not the mere offspring of a fertile imagination, or a good library. It has not been committed to the press, till after fifteen years of observation and experience, in a vast variety of climates, and with some *unusual sources of information* on the subject which it more particularly embraces. To this it may be added, that the Author has felt, in his own person, that INFLUENCE, and most of those EFFECTS of Tropical Regions, which he has here undertaken to investigate.—

> "Alternate change of climate had he known,
> And felt the fierce extremes of either zone;
> Where polar skies congeal th' eternal snow,
> Or equinoctial suns for ever glow—
> Where seas of glass, with gay reflexion, smile
> Round the green coast of JAVA's palmy isle,
> To where the Isthmus, lav'd by adverse tides,
> Atlantic and Pacific seas divides."

Under these circumstances, he comes before the Public with respect, but confidence; neither wantonly provoking, nor meanly shunning, the eagle eye of criticism.

It will probably be suggested, indeed, that to tread in the steps of Lind, Clark, Moseley, &c. must be a dangerous, if not a presumptuous course. The Author does not conceive that he can be fairly exposed to any peril or censure in

these respects, unless he either *rashly* opposes or *servilely* copies his illustrious predecessors.

He believes his greatest enemies will not accuse him of the *latter*, and to the *former* he will not plead guilty, for the following reasons:—First, because his knowledge is derived from sources equally as good and authentic as theirs—OBSERVATION AND PERSONAL SUFFERING. Secondly, as he took the pains to observe, so has he claimed the right to think, for himself; determined never to succumb to any doctrines or opinions, whatever might be their authorities, when they clashed with the evidence of his own senses.

This independence will, no doubt, be branded with the opprobrious title of arrogance, especially as he has sometimes, while exposing the errors, indulged himself in a smile at the follies or inconsistencies of certain eminent characters, whose dogmas he found to be far from infallible, however currently they pass among those who have neither the opportunity nor inclination to put them to the experimentum crucis.

On this head, therefore, he is prepared to receive his full share of obloquy; perfectly indifferent whether it come in a roaring torrent, or in the most insignificant stream. It may sweep away the airy fabrics of imagination or theory—it will idly rave against the rocky edifice of facts. On the *latter*, he has patiently expended his time, and exercised his talents—on it rest all his hopes. In the overthrow of the *former*, [which, however, are generally under protection of the latter] he may regret the fall of a fanciful pavilion, rather than the loss of a useful mansion.

In attempting to extend the utility of his Essay beyond the contracted sphere of medical perusal; [without derogating, however, from the dignity of a philosophical discussion] he can cite the precedent of almost every writer on Tropical Climates. Indeed, the *necessity* of such a plan will be rendered evident by the following passage from Dr. Balfour, whose situation, at the Head of the Medical Department in Bengal, gave him ample opportunities of forming a correct judgment on the point in question.

Speaking of the army officers in the East Indies, he remarks, that "being constantly em-"ployed, during the first years of their service, "in the most unhealthy corners of the country, "remote from medical assistance, their *success, "reputation, health, and lives*, and the lives of all "around them, depend often on the MEDICAL "SKILL which they may have acquired."*

Now, it is very singular, that notwithstanding the extensive medical establishments of the India Company in the East, and the known ability which very generally characterizes their officers there, we have scarcely any detailed account of the climate and diseases of that vast empire, while volumes after volumes have issued from the press, on the climate and diseases of the West-India islands!

Where, for instance, are we to look for any *modern* account of the Endemic of Batavia? a settlement over which the British flag now waves, and whose very *name* is associated, in the European mind, with sickness and death!

---

* Preface to Treatise on Sol-lunar Influence, p. xiii.

—As for Hepatitis, it is scarcely noticed by tropical writers, though it has been termed the "Endemic of India," and we are forced to learn its nature and cure from a London physician, who never set foot between the tropics.

The last volume on India Diseases, [Mr. Curtis's] was written thirty years ago; and that many discoveries and improvements have since taken place, the Author of the present Essay trusts will soon be manifest.

Although the general scope of his observations bears on all tropical climates, yet he has directed his attention more particularly to the Eastern world, both because he was better acquainted with it, and less was written on its medical topography. But the western hemisphere has not been neglected. The grand endemic scourge [Yellow Fever] is carefully considered, and Dysentery is common to both countries.

He flatters himself that the Prophylactic part of this Essay, which applies to all intertropical situations, will be found to contain a better Hygeian code than is detailed in any preceding Work on the same subject.

It is not the Author's intention, however, to have recourse to canting apologies for his intrusion on the Public; if he has neither corrected former errors, nor added any new and useful information to the original stock of knowledge, his Essay will soon meet the fate it deserves;—if otherwise, it will probably have its reward.—At all events, he will neither deprecate the one, nor cringe for the other.

TABLE OF CONTENTS.

	PAGE
Preliminary Remarks - - - - -	1 to 6

PART I.

PRIMARY OR GENERAL EFFECTS OF HOT CLIMATES ON EUROPEAN CONSTITUTIONS.

Sec. 1.—Perspiration - - - - -	7—14
—— 2.—Sympathy - - -	14—17
—— 3.—Biliary Secretion - -	17—25
—— 4.—Lichen Tropicus, or Prickly Heat	25—28

PART II.

SPECIFIC DISEASES.

Sec. 1.—Endemic Fever of Bengal -	29—116

Fatality of, p. 29. Insalubrity of Marshes, ib. Island of Walcheren, 30. Inundation of Bengal, ib. Impregnations of the Ganges, 31—33. Sunderbunds, 34. Rainy season, 35. Description of the Marsh Fever, 37—39. Treatment, 40—52. Dr. Balfour's plan, 52—55. Native remedies, 57—58. Remote causes, 59. Marsh Miasmata, 60—78. Predisposing causes, 79—88. Sol-lunar influence, 89—93. Theory of Fever, 94—102. Endemics of the East and West compared, 103—107. Contagion, 108—110. Intermittents, 110—116.

PAGE

SEC. 2.—BILIOUS FEVER, illustrated on a large Scale at Bombay - - 117—147

SEC. 3.—CONTAGIOUS FEVER - - 148—165

Exemplified in H. M. Ships Russel and Sceptre, in the East Indies, with Cases, p. 150. Interesting narrative, 154. Remarks, 161—165.

SEC. 4.—ENDEMIC OF BATAVIA - 166—231

Expedition against that Settlement in the year 1800, p. 166. Position of the squadron, 167. Islands of Onrust and Edam, 168—169. Dreadful fatality on the island of Edam, 170. Description of the Batavian fever, 171—178. Singular escape of four patients under the influence of mercury, 178. Treatment, 179—184. Sixteen detailed cases of Batavian fever, illustrating its nature and cure, 184—221. Remarks, 222—231.

SEC. 5.—ENDEMIC OF THE WEST INDIES; or, YELLOW FEVER. By a Physician who had charge of an hospital nearly six years in that country - - 232—250

SEC. 6—HEPATITIS - - - - 251—344

Climate of the East Indies, 251—258. Climate of the West, 259—264. Remote and proximate causes of Hepatitis, 265. CUTANEO-HEPATIC SYMPATHY, 265—273. Application of cold, 274—276. Symptoms of Hepatitis, 277—283. Treatment, 284—288. Objections against mercury

PAGE

refuted, 289—303. Predisposing and exciting causes, 304—307. CHRONIC HEPATITIS, 308. Treatment, 311—314. Remarks on change of climate, 315—318. SYMPATHETIC CONNECTION BETWEEN THE HEPATIC AND MENTAL FUNCTIONS INVESTIGATED, 319—344.

SEC. 7.—DYSENTERY - - 345—395

Select specimens of ancient lore, from Dr. Moseley, 346—348. Discrepancy among authors respecting the nature, proximate cause, and cure of Dysentery, 349—355. An attempt to reconcile their jarring opinions and practices, 356—358. Rationale of the different methods of cure, 358—362. Whether it arises from contagion in tropical climates, 363—364. The Author's own case of Dysentery, 365—368. Remote cause, 369. Cure of Dysentery, 370—376. Singular method of treatment, 377—379. Remarks on former methods in the East Indies, 380—382. In the West Indies, 383. At the Cape of Good Hope, 384—387. Singular opinions of Dr. Wright, 387—388. Why residence in hot climates predisposes to Dysentery, 389. Practical remarks, 391, 395.

SEC. 8.—CHOLERA MORBUS & MORT DE CHIEN 396—414

It's supposed cause, INCREASED SECRETION OF BILE, 396. Description of Cholera, as it appears in this country, 397. Investigation of it's supposed cause, 398—400. Proved NOT to depend on increased, but diminished, or checked secretion of bile, 401. Mort de Chien, 402—414.

PAGE

PART III.

PROPHYLAXIS; or, TROPICAL HYGIENE.

Preliminary Remarks - -	415-419
SEC. 1. DRESS - - - - -	420-430
SEC. 2. FOOD - - - -	431-443
SEC. 3. DRINK - - - -	444-455
SEC. 4. EXERCISE, &c. - -	456-466
SEC. 5. BATHING - - - -	467-471
SEC. 6. SLEEP - - -	472-476
SEC. 7. THE PASSIONS - - -	477-479
SEC. 8. NAVAL HYGIENE & DISCIPLINE	481-534
Preliminary Remarks - - -	481-485
The Captain - - -	486-492
The Officers - - -	493-498
The Surgeon - - -	499-511
The Seamen - - -	511-534

THE

Influence of Tropical Climates

ON

European Constitutions.

MIGRATION.

I BELIEVE it is a settled opinion among Philosophers, that the Constitution of Man is better adapted to bear those changes of temperature, &c. experienced in migrating from a Northern to a Tropical region, and vice versa, than that of any other animal. They proudly observe, that this power of accommodating itself to all climates, is a distinctive characteristic of the human species, since no other animal can endure transplantation with equal impunity.

I think it would not be difficult to shew, that for this boasted prerogative, Man is, perhaps, more indebted to the ingenuity of his mind, than to the pliability of his body. Nor can this argument be considered favourable to materialism; on the contrary, by ascribing the superiority to *mind*, not *matter*, it will be found to militate against that gloomy doctrine.

To me, indeed, it appears, that man and other animals start on very unequal terms, in their emigrations. Man, by the exertion of his mental faculties, can raise up a thousand barriers round him, to obviate the deleterious effects of

climate on his constitution; while the poor animal, tied down by instinct to a few simple modes of life, is quite defenceless. Nature must do all for the latter; and, in fact, it is evident that this indulgent mother does compensate, in some degree, for the want of reason, by producing such corporeal changes, as are necessary for the animal's subsistence under a foreign sky, in a *shorter* space of time, than is necessary for effecting correspondent changes in man. One example may suffice. The tender and innocent sheep, when transported from the inclemency of the north, to pant under a vertical sun on the equator, will, in a few generations, exchange its warm fleece of *wool* for a much more convenient coat, of *hair*. "Can the Ethiopian change his hue," in the same period, by shifting his habitation from the interior of Africa to the shores of the Baltic? Or will it be said, that the fair complexion of Europeans, may, in two or three generations, acquire the sable tinct of the inter-tropical natives, by exchanging situations? Assuredly not. Where then is the superior pliancy of the human constitution? The truth is, that the tender frame of man is incapable of sustaining that degree of exposure to the whole range of causes and effects incident to, or arising from vicissitude of climate, which so speedily operates a change in the structure, or, at least, the exterior, of unprotected animals.

But it is observed, that of those animals translated from a temperate to a torrid zone, "many die suddenly, others droop, and all degenerate." This is not to be wondered at, considering the disadvantages under which they labour. Man

would not fare better, if placed in similar circumstances. Even as it is, the parallel is not far from applying. Of those Europeans who arrive on the banks of the Ganges, many fall early victims to the climate, as will be shewn hereafter. That others droop, and are forced, in a very few years, to seek their native air, is also well known. And, that the successors of all would *gradually degenerate*, if they remained permanently in the country, cannot easily be disproved; while a very striking instance, corroborative of the supposition, may be here adduced.

Whoever has attentively examined the posterity of De Gama, and Albuquerque, now scatterred over the coast of Malabar, the plains of Bengal, and the Island of Macao, once the theatres of Lusitanian pre-eminence, will be tempted to exclaim:—

'Twas not the sires of such as these,
Who dared the elements and pathless seas;
Who made proud Asian monarchs feel
How weak their gold was against Europe's steel.
But beings of *another mould*,—
Rough, hardy, vigorous, manly, bold!

In answer to this, it will be alleged, "that they have married and blended with the natives until all shade of distinction is obliterated." But it is well known to those who have resided long in India, that the two great prevailing classes of society in that country, the Hindoos and Mahomedans, hold these descendants of the Portuguese in the most marked and sovereign contempt; while the latter, still retaining a remnant of the

religion, and all the prejudice of their progenitors, entertain an equal abhorrence of their idolatrous and infidel neighbours. This being the case, we may fairly presume, that the intermixture has been much less extensive than is generally supposed; an inference strongly supported, if not confirmed, by the well-known fact, that, while the people in question have forfeited all pretensions to the European *complexion*, their more stubborn *features* still evince a descent, and establish their claim to an ancestry, of which they are superlatively proud. Let those who deny *one common origin* of mankind, and that climate is the *sole* cause of complexion, explain this phenomenon if they can.

On the other hand, if we look at inter-tropical natives approaching our own latitudes, the picture is not more cheering. The African children brought over by the Sierra Leone Company for education, seldom survived the third year in this country. "They bear the first win- "ter, (says Dr. Pearson) tolerably well, but "droop during the second, and the third gene- "rally proves fatal to them."

The object of these remarks, which, at first sight might seem irrelevant, will now appear.—Since it is evident that nature does not operate more powerfully in counteracting the ill effects of climate on man, than on other animals, it follows that we should not implicitly confide, as too many do, in the spontaneous efforts of the constitution, but on the contrary, call in to its aid, those artificial means of prevention and melioration, which reason may dictate and ex-

perience confirm. In short, that we should, as my mòtto expresses it:—

> ——————"Study well the clime
> "Mould to its manners our obsequious frames,
> "And mitigate those ills we cannot shun."

That these salutary precautions are too often despised or neglected, a single quotation from a Gentleman, who has resided more than *twenty* years in India, and whose talent for observation is, in my opinion, unequalled, will put beyond a doubt. "Nothing can be more preposterous "(says Capt. Williamson*), than the significant "sneers of Gentlemen on their first arrival in "India; meaning thereby to ridicule, or to "despise what they consider effeminacy or "luxury. Thus several may be seen walking "about without chattahs (i. e. umbrellas) dur-"ing the greatest heats. They affect to be "ashamed of requiring aid, and endeavour to "uphold, by such a display of indifference, the "great reliance placed on *strength of consti-"tution.* This unhappy infatuation rarely ex-"ceeds a few days: at the end of that time, "we are too often called upon to attend the "funeral of the self-deluded victim.†"

It shall be my endeavour in this essay, after tracing the causes, and portraying the effects of tropical diseases, in such a manner as must impress the most heedless European with the necessity of circumspection on approaching the scene of danger, to furnish a code of instruc-

* Author of "Oriental Field Sports," "East India Vade Mecum," &c.

† East India Vade Mecum, vol. 2. page ii.

tions deduced from principle and experience, that cannot fail to prove a useful companion to every one who regards health as the grand source of happiness, and the most invaluable blessing which heaven can bestow. Many a day's anxiety and personal suffering should I have escaped, had I been furnished with so friendly a monitor!

Without any very fastidious regard to arrangement, it will still be necessary, for the sake of perspicuity, to observe some order. I shall therefore divide the subject into three principal heads, viz:—

1.—The Primary or General Effects of a Tropical Climate on the European Constitution.

2.—The Specific or Actual Diseases.

3.—Phrophylaxis; or the Means of Counteracting the Influence of Climate, and Preserving Health.

PART I.

PRIMARY OR GENERAL EFFECTS.

UNDER this head, I shall consider some of those gradual and progressive changes in the constitution, and deviations from previous health and habits, which, though pre-disposing, and verging, as it were, towards, yet fall short of actual disease.

These are consequences which all must expect, more or less, to feel, on leaving their native soil, and, of course, in which all are directly interested. For, although a few individuals may occasionally return from even a long residence in hot climates, without having suffered any violent illness, or much deterioration of constitution; yet the great mass of Europeans will certainly experience the effects developed under this head, and many others of minor consequence, which will be taken notice of in different parts of the work.

It is, however, by the most scrupulous attention to these *incipient deviations from health*, by early arresting their growth, or at least retarding, as much as possible, their progress, that we can at all expect to evade those dangerous diseases, to which they inevitably, though often imperceptibly, tend.

Sec. 1.—The transition from a climate, whose medium heat is 52°. of Fahrenheit, to one where the thermometer ranges from 80°. to 100°. and sometimes higher, might be supposed, a priori,

to occasion the most serious consequences. Indeed, the celebrated Boerhaave, from some experiments on animals, concluded, that the *blood would coagulate in our veins*, at a temperature very little exceeding 100°. More modern trials, however, have proved that the human frame can bear, for a short time at least, more than double the above degree of atmosperical heat, and that too without greatly increasing the natural temperature of the body.

The benevolent author of our existence has endowed man, as well as other animals, with the power, not only of generating heat, and preserving their temperature, in the coldest regions of the earth; but has also provided an apparatus for carrying off any super-abundance of it that might accumulate where the temperature of the atmosphere approaches to, or exceeds that of the body. With the *former* process, which is supposed to be carried on in the lungs, we have, at present, nothing to do; the *latter* is one which deserves great attention, and which will meet with ample consideration in various parts of this essay.

We are no sooner beneath a vertical sun, than we begin, as may naturally be supposed, to experience the disagreeable sensation of unaccustomed warmth; and as the temperature of the atmosphere, even in the shade, now advances within ten or twelve degrees to that of the blood, and in the sun, very generally exceeds it, the heat, perpetually generated in the body, cannot be so rapidly abstracted, as hitherto, by the surrounding air, and would, of course, soon accumulate so as to destroy the

functions of life itself, did not Nature immediately open the sluices of the skin, and by a flow of *perspiration*, reduce the temperature of the body to its original standard.

Whether the super-abundant animal heat combines with the perspirable fluid, and thus escapes; or whether the refrigeration takes place on the principle of evaporation, it is more a matter of curiosity than practical importance to ascertain. We know the fact, that perspiration is a cooling process. The modus operandi—

"Let sages versed in Nature's lore explain*."

When we contemplate this admirable provision of nature, against what might appear to us an unforeseen event;—when we survey the resources and expedients which she can command on all emergencies—her power of supplying every waste, and restraining every aberration of the constitution, we would be almost tempted to conclude, that man was calculated for immortality! But, alas!

————————"There is a point,
"By Nature fixed, whence life must downward tend."

---

* Dr. Mosely solves the difficulty without hesitation, and in a *truly philosophic manner*.—"Living (says he) in an hot "steam, as it were, their bodies are filled with it; and the "turgidness and firmness of the capillary vessels of newly-"arrived Europeans, require some time to render them suf-"ficiently *pervious* to let out the *inflamed* and rarified parts "of their rich blood by the pores, fast enough to cool it, and "bring it down to a state suitable to the climate."—Page 68. —How did the steam get in?—One would suppose, that it would make its exit with more facility than its entrance.

Till at length, this wonderful machine, exhausted by its own efforts at preservation, and deserted by its immaterial tenant, sinks, and is resolved into its constituent elements !

Nascentes morimur, finisque ab origine pendet.

But, to return, we must not conclude that this refrigerating process, adopted by nature to prevent more serious mischief, is, in itself, unproductive of any detriment to the constitution—far otherwise. " If (says Dr. Currie) the orifices do *not* " pour out a proportionate quantity of perspira-" tion, disease must ensue from the direct stimulus " of heat ; and if the *necessary* quantity of per-" spiration takes place, the system is *enfeebled* by " the evacuation*."

Here, then, we have Scylla on one side, and Charybdis on the other :—morbid accumulation of heat if we do not perspire enough—debility if we do. How are we to direct our course through this intricate and dangerous navigation ?

Dr. Currie.

" Europeans who go to the West Indies are " more healthy, in proportion, as they perspire " freely, especially if they support the discharge " by a moderate use of *gently stimulating liquids,* " *stopping short of intoxication.*"—ib.

Dr. Mosely.

" I aver from my own knowledge and custom, " as well as from the custom and observations of " others, that those who drink *nothing but water,* " are but little affected by the climate, and can

* Medical Reports, vol. 1, p. 275.

" undergo the greatest fatigue without incon-
" venience."—*Tropical Diseases, p.* 57.

Who shall decide when Doctors disagree ?

Without meaning to set up the judgment of a Moseley in competition with that of a Currie, on other subjects, candour obliges me to confirm, by personal observation and experience, the truth of Dr. Moseley's remark. Dr. Currie never was in a tropical climate, therefore had the above piece of information from others; and it is one of the very few erroneous positions in his invaluable work. Nevertheless, these apparently opposite directions, are not so contradictory in *fact* as in *terms*. The principle on which both act is the same, though the means are different. Dr. Currie's plan of supplying the stomach with "gently stimulating liquids," will undoubtedly keep the morbid heat from accumulating, by driving out a copious perspiration; but it will, at the same time, lead to debility, by carrying off much more of that fluid than is necessary, by which means the thirst, instead of being allayed, will be increased; and what is still worse, the body will be rendered more susceptible to the subsequent impressions of cold, the deleterious effects of which, at these times, are much more extensive than is generally believed, as will be shewn in another part of the work.

Dr. Moseley's plan, on the other hand, far from preventing perspiration, will be found, in general, to promote it, but at the same time restrain its *excess*.—A familiar example or two will elucidate this subject.

Perspiration.

We will suppose two Gentlemen to be sitting in a room, at Madras, or in Jamaica, just before the sea-breeze sets in, both complaining of thirst, their skin hot, and the temperature of their bodies 100°, or two degrees above the natural standard. One of them, pursuant to Dr. Currie's instructions, applies to the sangaree bowl, or porter cup, and after a draught or two, brings out a copious perspiration, which soon reduces the temperature to 98°. It will not stop here, however, nor indeed will the Gentleman, according to the plan proposed; for instead of putting the bulb of the thermometer under his tongue, to see if the mercury is low enough, he, feeling his thirst increased by the perspiration, very naturally prefers a glass or two more of the sangaree—"to support the discharge"—still, however, "stopping short of intoxication." Now, by these means, the temperature is reduced to 97° or $96\frac{1}{2}$°, in which state, even the slight, and otherwise refreshing chill of the sea-breeze, checks more or less the cuticular discharge, and paves the way for future maladies.

Whether this is, or is not, a true representation of the case, let Dr. Currie's own words decide.

"If (says he) ut supra, the necessary quantity "of perspiration takes place, viz. by the use of "gently stimulating liquids, the system is en-"feebled by the evacuation, and the extreme "vessels losing tone *continue* to transmit the per-"spirable matter, *after* the heat is reduced to its "natural standard, or, perhaps, *lower*; in which "situation, we can easily suppose that even a "*slight degree* of external cold may become dan-"gerous."—Vol. 1. p. 273.

Let us now turn to the other Gentleman, who pursues a different line of conduct. Instead of the more palatable potation of sangaree, he takes a draught of plain cold water. This is hardly swallowed before the temperature of his body loses by abstraction alone, one degree, at least, of its heat. It is now, we will suppose, at 99°. But the external surface of the body immediately sympathising with the internal surface of the stomach, relaxes, and a *mild* perspiration breaks out, which reduces the temperature to its natural standard, 98°. Farther, this simultaneous relaxation of the two surfaces, completely removes the disagreeable sensation of thirst; and, as the simple "antedeluvian beverage," does not possess many Circean charms for modern palates, there will not be the slightest danger of its being abused in quantity, or the perspiratory process carried beyond its salutary limits. Nor need we, on the other hand, apprehend its being neglected; since, from the moment that the skin begins to be constricted, or morbid heat to accumulate, the sympathising stomach and fauces will not fail to warn us of our danger, by craving the proper remedy. Taken therefore as a general rule, the advantages of the *latter* plan are numerous—the objections few. It possesses all the requisites of the *former*, in procuring a reduction of temperature, (the only legitimate object which the admirers of sangaree and copious perspiration can have in view) without any danger of bringing it below the proper level, or wasting the strength, by the profuseness of the discharge.

It is true, there is no general rule without exception; and there may be instances, wherein

the use of "gently stimulating liquids" is preferable to that of cold drink.

For example:—during, or subsequent to violent exertion, under a powerful sun; or in any other situation in a tropical climate, when profuse perspiration is rapidly carrying off the animal heat, and especially when fatigue or exhaustion has taken place, or is impending—then cold drink would be dangerous, on the same principle as external cold. But these cases rarely happen through *necessity*, to Europeans, particularly in the East; and they will be duly considered in the prophylactic part of this essay.

I have been more prolix on this point, than may have seemed necessary to the medical reader; but considering that this is generally the first erroneous step which Europeans take, on entering the tropics, and that the function in question (perspiration) is more intimately connected with another very important one in the human frame, than is commonly supposed; I thought it proper to set them right in limine. The probablity of *future suffering* will rarely deter the European from indulging in *present gratifications*; but where these last, *i. e.* the stimulating liquids, are represented, from high authority, as not only innocent but salutary, it will require some strength of argument to persuade young men to relinquish their use, or to check the wide-spreading evil.

Sec. 2.—In attempting to delineate the influence of hot climates on the European constitution, although we may endeavour—

"To chain the events in regular array;"

yet, it must be confessed, that nature spurns all such artificial arrangements; since simultaneous impressions on several organs, must produce co-temporary and combined effects, which our limited faculties are scarcely capable of embracing in thought, much less, of describing in the fetters of language.

Taking facts, however, and personal observation for land-marks, I shall pursue the investigation, as nearly as possible, in the order of nature and of events.

There exists between different, and often distant parts of the body, a certain connexion or relation, which, in medical language, is called "consent of parts:"—that is, when *one* is affected by particular impressions, the *other* sympathises, as it were, and takes on a kind of analogous action.

This sympathy, or consent of parts, has never been *satisfactorily* accounted for, by the ablest of our physiologists, nor—(mirabile dictu!) by the most ingenious of our theorists. As all, however, are agreed in respect to the *fact*, we may allow the *cause* to remain locked up in Nature's strong box, in company with many other arcana, which she does not seem disposed to reveal.

Of these sympathies, none is more universally remarked, or familiarly known, than that which subsists between the *external* surface of the body, and the *internal* surface of the alimentary canal. This, indeed, seems less incomprehensible than many others, since the *latter* appears to be a continuation of the *former*, with the exception of the cuticle. In the first section, I gave an instance of the skin sympathising with the stomach,

where the cold drink was applied to the latter organ. Had the water been applied to the external surface of the body, on the other hand, the stomach would have sympathised, and the thirst been assuaged.

The loss of tone, then, in the extreme vessels of the surface, in consequence of excessive, or long continued perspiration is, on this principle, necessarily accompanied, or soon succeeded by a consentaneous loss of tone in the stomach, and fully accounts for that anorexia, or diminution of appetite, which we seldom fail to experience on entering the tropics, or, indeed, during hot weather in England. Now this, although but a link in the chain of effects, seems to me a most wise precaution of nature, to lower and adapt the irritable, plethoric, European constitution, to a burning climate, by guarding very effectually against the dangerous consequences of repletion. This view of the subject will set in a clear light, the pernicious effects of stimulating liquids, operating on an organ already debilitated (probably for salutary purposes), and goading it thereby to exertions beyond its natural power, producing a temporary plethora, with a great increase of subsequent atony.

A remark, which every person of observation must have made, even in this country, during the summer, but particularly in equatorial regions, will farther elucidate this subject. If by walking, for instance, or any other bodily exercise, in the heat of the sun, during the forenoon, especially near dinner hour, the perspiration be much increased, and the extreme vessels relaxed, we find,

on sitting down to table, our appetites entirely gone, until we take a glass of wine, or other stimulating fluid, to excite the energy of the stomach. Under such circumstances of artificial or forced relish for food, it is not to be wondered at, that the digestion should be incomplete, and that the intestines should suffer from the passage of badly concocted aliment. Observation and personal feeling have taught me this,—that in hot climates, perhaps during hot weather in all climates, an hour's cool repose before dinner is highly salutary, and if on commencing our repast, we find we cannot eat without *drinking*, we may be assured that it is nature's caveat,—to beware of eating at all. This will be deemed hard doctrine by some, and visionary by others; but I know it is neither one nor the other: and those who shall neglect or despise it, may feel the bad consequences, when it is too late to repair the error.

There are several other causes, however, which operate in conjunction with the above, to impair the appetite:—one of which is, the want of rest at night. After disturbed and unrefreshing sleep, (but too common in tropical climates) the whole frame languishes next day, and the stomach participates in the general relaxation. The means of managing and obviating these effects, will be pointed out in the prophylactic part of this essay.

Sec. 3.—We now take a wider range, and come to a subject intricate in its nature, extensive in its bearings, and important in its consequences. It will readily be understood, that I allude to the influence of a tropical climate on the liver and its functions.

Biliary Secretion.

This immense gland is the largest organ in the human frame; for neither the brain, heart, spleen, nor kidnies, can be at all compared with it; and the lungs, though occupying a larger extent when inflated, yet if condensed to equal solidity, would fall short in size and weight.

Now, since nature, throughout her works, has seldom been accused of supererogation, we may safely conclude that the importance of this organ's function, in the animal economy, is commensurate with its magnitude. The structure of the liver has been explored by the anatomist, and the bile secreted in it, analysed. But, although the chymist has separated this fluid into its constituent parts; yet physiologists are not exactly agreed in regard to the purposes which it answers in the system. It is proved to be antiputrescent, and in conjunction with the pancreatic juice, it probably assists in animalising and eliminating the chyle from the chyme.

It is supposed not to enter the circulation naturally, at least in an unchanged state along with the chyle; but, there can be little doubt of its preventing the putrefactive or fermentative process from taking place in the excrementitious part, which is, ultimately, to be expelled the body. Another and a principal use of this important fluid appears to consist in stimulating the intestines into their peculiar peristaltic motion, and thus propelling their contents continually forward, to give the lacteals an opportunity of drinking up and conveying to the blood the nourishment by which our frames are supported.

In this point of view, it is the natural tonic of the intestines, and also the purgative which frees

them from all fecal matter, the retention of which is productive of so much inconvenience, not to say disease.

The first effect of a tropical climate on the function of the liver, is universally allowed to be an *increase* of the biliary secretion. This is so evident in our own country, where the summer and autumn are distinguished by diseases arising from super-abundant secretion of bile, that it would be waste of time to adduce any arguments in proof of the assertion. But why an increase of the atmospherical temperature should so invariably augment the hepatic secretion, in all climates, and all classes of people, is totally unaccounted for. When Dr. Saunders conjectures that richness of blood, tenseness of fibre, grossness of diet, and rapidity of circulation, are the causes of Europeans being at first more afflicted with bilious redundancy in India than the native Hindoos, he gives us only a *comparative* view of things, and leaves us completely in the dark with respect to the *modus operandi* of heat, as a general and universal spur on the secretory vessels of the liver.

Were this a question of mere curiosity, or theoretical speculation, I should pass it by unnoticed; but from long and attentive observation, as well as mature reflection, I believe that I have discovered a connection between two important functions in the animal economy, which will let in some light on this subject, and lead to practical inferences of considerable importance.

The arguments and facts adduced in support of this connexion will be found under the heads Hepa-

titis, Dysentery, and in other parts of this essay. In the mean while, I shall merely state in a few words the *result* of my observations, leaving the reader to give credit to it, or not, as he may feel inclined.

There exists then between the extreme vessels of the vena portarum in the liver, and the extreme vessels on the surface of the body—in other words, between *biliary secretion and perspiration,* one of the strongest sympathies in the human frame; although entirely unnoticed hitherto, as far as I am acquainted. That these two functions are regularly, and to appearance, equally increased, or at least influenced by *one* particular agent (atmospherical heat) from the cradle to the grave,—from the pole to the equator, will be readily granted by every observer: and that this *synchronous action* alone, independent of any other original connection, should soon grow up into a powerful sympathy, manifesting itself when *either* of these functions, came under the influence of *other agents,* is a legitimate conclusion in theory, and what I hope to prove by a fair appeal to facts. This last consideration is the great practical one; for it is of little consequence whether this sympathy was originally implanted by the hand of nature at our first formation, or sprung up gradually in the manner alluded to, provided we know that it actually exists, and that by directing our operations towards any *one* of the functions in question, we can decisively influence the *other.* This is what I maintain; but here I only offer assertions; in a future part of the work I shall bring forward facts and cogent arguments in proof of them. At present let this " consent of parts" between the skin and the liver, which I shall beg

leave to denominate the "*Cutaneo-hepatic Sympathy,*" account for the augmented secretion of bile, which we observe on arriving in hot climates, corresponding to the increased cuticular discharge. I shall here offer one practical remark, resulting from this view of the subject, and which will be found deserving of every European's attention on his emigration to southern regions. Namely, that as the state of the perspiratory process is a visible and certain index to that of the biliary, so every precautionary measure, which keeps in check, or moderates the profusion of the *former* discharge, will invariably have the same effect on the *latter*, and thus tend to obviate the inconvenience, not to say the disorders, arising from redundancy of the hepatic secretion. To this rule I do not know a single exception; consequently its universal application can never lead astray in any instance. But this subject will be better elucidated, and more clearly explained hereafter.

To proceed. It is well known, without having recourse to Brunonian doctrines, that if any organ be stimulated to *inordinate* action, one of two things must in general ensue. If the cause applied, be constant, and sufficient to keep up, for any length of time, this *inordinate* action, serious injury is likely to accrue to the organ itself, even so far as *structural* alteration. But if the cause be only temporary, or the force not in any great degree, then an occasional torpor, or exhaustion, as it were, of the organ takes place, during which period its *function* falls short of the natural range. To give a familiar example, of which too many

of us are quite competent to judge :—thus, if the stomach be goaded to immoderate exertion to-day, by a provocative variety of savoury dishes, and stimulating liquors, we all know the atony which will succeed to-morrow, and how incapable it then will be of performing its accustomed office. It is the same with respect to the liver. After great excitement, by excessive heat, violent exercise in the sun, &c. &c. a torpor succeeds, which will be more or less, according to the degree of previous excitement, and the length of time which the stimulating causes have been habitually applied. For instance, when Europeans first arrive between the tropics, the degree of torpor bears so small a proportion to that of preceding excitement, in the liver, that it is scarcely noticed ; parcularly as the debilitated vessels in this organ, *continue* (similar to the perspiratory vessels on the surface) to secrete a depraved fluid for some time *after* the exciting cause has ceased ; hence the *increase* of the biliary secretion occupies our principal attention. But these torpid periods, however short, at first, gradually and progressively increase, till at length they far exceed the periods of excitement ; and then a *deficiency* of the biliary secretion becomes evident. This is not only consonant to experience, but to analogy. Thus when a man first betakes himself to inebriety, the excitement occasioned by spirits, or wine, on the stomach and nervous system, far exceeds the subsequent atony, and we are astonished to see him go on for some time without, apparently, suffering much detriment in his constitution. But the period of excitement is gradually curtailed, while

that of atony increases, which soon forces him not only to augment the dose, but to repeat it oftener and oftener, till the organ and life are destroyed!

Now it is somewhat singular, that this alternation of redundancy and deficiency, or in other words, *irregular* secretion in the biliary organ, should pass unnoticed by writers on hot climates. They, one and all, represent the liver as a colossal apparatus, of the most Herculean power, that goes on for years, performing prodigies in the secreting way, without ever being exhausted for a moment, or falling *below* the range of ordinary action, till structural derangement, such as schirrosity, incapacitates it for its duty!

A very attentive observation of what passed in my own frame, and those of others, has led me to form a very different conclusion, and the foregoing statement will, I think, be found a true and natural representation of the case. I shall afterwards shew, that the secretion in question is frequently below *par*, in quantity, at the very time when it is considered to be redundant—all arising from irregularity and vitiation.

Here then, we have two very opposite states of the liver and its functions. 1st, inordinate action, with increased secretion—the periods gradually shortening. 2d, Torpor of the vessels in the liver, with deficient secretion—the periods progressively lengthening. In both cases, the bile itself is *vitiated*.

We may readily enough conceive how this last comes to pass, by an analogical comparison with what takes place in the stomach during, and subsequent to, a debauch. In both instances, we

may conclude that the chyme passes through the pyloris into the duodenum, in a state less fit for chylification, than during a season of temperance and regularity. So, during the increased secretion, and subsequent inactivity in the liver, the bile passes out into the intestines deteriorated in quality, as well as superabundant or deficient in quantity.

In what this vitiation consists, it is certainly not easy to say. In high degrees of it, attendant on hurried secretion, both the colour and taste are surprisingly altered; since it occasionally assumes all the shades between a deep bottle green and jet black; possessing, at one time, an acidity that sets the teeth on edge; at other times, and indeed, more frequently, an acrimony that seems absolutely to corrode the stomach and fauces, as it passes off by vomiting, and when directed downwards, can be compared to nothing more appropriate than the sensation which one would expect from boiling lead flowing through the intestines. Many a time have I experienced this, and many a time have my patients expressed themselves in similar language. But these are extremes that will be considered under Cholera Morbus, Bilious Fever, Dysentery, &c. The slightly disordered state of the hepatic functions, which we are now considering as primary effects of climate, and within the range of health, may be known by the following symptoms:—Irregularity in the bowels; general langour of body and mind; slight nausea, especially in the mornings, when we attempt to brush our teeth; a yellowish fur about the back part of the tongue; unpleasant taste in the mouth, on getting out of bed; a tinge in the eyes and

complexion, from absorption of bile; the urine high coloured, and a slight irritation in passing it; the appetite impaired, and easily turned against fat or oily victuals. These are the first effects, then, of increased and irregular secretion of bile, and will appear in all degrees, according as we are less or more cautious in avoiding the numerous causes that give additional force to the influence of climate. For example: if I use more than ordinary exercise—expose myself to the heat of the sun—or drink stimulating liquids to-day, an increased and vitiated flow of bile takes place, and to-morrow produces either nausea and sickness at stomach, or a diarrhœa, with gripings and twitchings in my bowels. But a slight degree of inaction or torpor succeeding, both in the liver and intestines, there will probably be no alvine evacuation at all, the ensuing day, till a fresh flow of bile sets all in motion once more. These irregularities, although they may continue a long time without producing much inconvenience, especially if they be not aggravated by excesses; yet they should never be despised, since they inevitably, though insensibly, pave the way for serious derangement in the biliary and digestive organs, unless counteracted by the most rigid temperance, and the prophylactic measures which I shall carefully detail in their proper place. The reciprocal influence and effects which the hepatic and mental functions exercise on each other, will form an interesting inquiry, under the article Hepatitis.

Sec. 4.—Among the primary effects of a hot climate, (for it can hardly be called a disease) we may notice the prickly heat, (Lichen tropicus) a very

troublesome visitor, which few Europeans escape.

This is one of the miseries of a tropical life, and a most unmanageable one it is. From mosquittoes, cock-roaches, ants, and the numerous other tribes of depredatórs on our *personal* property, we have some defence by night, and, in general, a respite by day; but this unwelcome guest assails us at all, and particularly the most unseasonable hours. Many a time have I been forced to spring from table and abandon the repast, which I had scarcely touched, to writhe about in the open air, for a quarter of an hour; and often have I returned to the charge, with no better success against my ignoble opponent! The night affords no asylum. For some weeks after arriving in India, I seldom could obtain more than an hour's sleep at any one time, before I was compelled to quit my couch, with no small precipitation, and if there were any water at hand, to sluice it over me, for the purpose of allaying the inexpressible irritation! But this was productive of temporary relief only; and what was worse, a more violent paroxysm frequently succeeded.

The sensations arising from prickly heat are perfectly indescribable; being compounded of pricking, itching, tingling, and many other feelings, for which I have no appropriate appellation.

It is usually, but not invariably accompanied by an eruption of vivid, red pimples, not larger in general, than a pin's head, which spread over the breast, arms, thighs, neck, and occasionally along the forehead, close to the hair. This eruption often disappears, in a great measure, when we are sitting quiet, and the skin is cool; but no sooner do we use any exercise that brings out a perspira-

tion, or swallow any warm, or stimulating fluid, such as tea, soup, or wine, than the pimples become elevated, so as to be very distinctly seen, and but too sensibly felt!

Prickly heat, being merely a symptom, not a cause of good health; its disappearance has been erroneously accused of producing much mischief: hence, the early writers on tropical diseases, harping on the old string of "humoral pathology," speak very seriously of the danger of *repelling*, and the advantage of "encouraging the eruption, by "taking small warm liquors, as tea, coffee, wine, "whey, broth, and nourishing meats."—*Hillary.*

Even the great *modern-ancient*, Dr. Moseley, retails the puerile and exaggerated dangers of his predecessor, in his usual dogmatical tone. "There "is great danger (says he) in repelling the prickly "heat; therefore cold bathing, and washing the "body with cold water, at the time it is out, is "always to be avoided." Every one cannot boast of being twelve years in a tropical climate, as he can; but this I will say, that every naval surgeon, who has been as many months in a hot climate, must have seen some hundreds, if not thousands plunging into the water, for days and weeks in succession, covered with prickly heat, yet without a single bad consequence ensuing.

Indeed, I never saw it even repelled by the cold bath; and in my own case, as well as in many others, it rather seemed to aggravate the eruption and disagreeable sensations, especially during the glow which succeeded the immersion. It certainly disappears suddenly sometimes on the *accession* of other diseases, but I never had reason to suppose, that its disappearance *occasioned* them.

I have tried lime juice, hair powder, and a variety of external applications, with little or no benefit. In short, the only means which I ever saw productive of any good effect in mitigating its violence, till the constitution got assimilated to the climate, were—light clothing—temperance in eating and drinking—avoiding all exercise in the heat of the day—open bowels—and last, not least, a determined resolution to resist with stoical apathy its first attacks. To sit quiet and unmoved under its pressure is undoubtedly no easy task, but if we can only muster up fortitude enough to bear with patience the first few minutes of the assault, without being roused into motion, the enemy, like the foiled tiger, will generally sneak off, and leave us victorious for the time.

PART II.

SPECIFIC DISEASES.

ENDEMIC FEVER OF BENGAL,

Commonly called the Marsh Remittent Fever.

Sec. 1.—The importance of this disease will not be questioned, when it is considered, that in the small portion of the Hoogly, running between Calcutta and Kedgeree, full three hundred European sailors (better than a fourth of the ships' crews) fall annual victims to its ravages !* The subject therefore is highly interesting, and must receive a considerable share of our attention.

There is no unmixed good in this world. The inundations of the Nile and the Ganges, while they scatter fertility over the valley of Egypt, and the plains of Bengal, sow with a liberal hand, at the same time, the seeds of dreadful diseases ! Hence, Cairo and Calcutta have severely suffered from the overflowings of their respective rivers.

These consequences are not confined to tropical countries alone. Swamps and marshes, in all latitudes, give rise to intermittents and remittents, varying in degree and danger, according to the heat, rains, and other circumstances of the season. The deleterious influence of an atmosphere, impregnated with marsh effluvia, on the human frame, is in some places astonishing. In the lower districts of Georgia, life is curtailed to forty or fifty years : while in certain swampy situations of

* Vide Capt, Williamson's East India Vade Mecum.

Virginia, (Peterborough) it is asserted that twenty years bound the contracted range of human existence!

I have myself, in rambling through the villages of Beveland and Walcheren, been struck with the conspicuous marks of premature old age, which all, beyond maturity, exhibited; particularly among the peasantry. On enquiring the ages of decrepid wretches, withered, sallow, and apparently on the borders of fourscore, I was surprised to find that fifty-five or sixty years were all they had numbered in these noxious fens. Often have I been asked by inattentive observers, why so unhealthy a country should present so great a number of very old people? But, to return to the Ganges.

This immense river, originating in the mountains of Tibet, and winding in a South-eastern direction, collecting its tributary streams from all quarters as it proceeds, after a course of more than a thousand miles, bursts its boundaries, in the rainy season, and covers the plains of Bengal with an expansive sheet of turbid water. But the ground springing a little, as it approaches the coast, prevents the inundation from rushing at once into the ocean: it therefore disembogues itself slowly through a multiplicity of channels, that intersect the great Indian Delta, or Sunderbunds, in every possible direction.

This check keeps the plains of Bengal overflowed from the latter end of July till the middle of October; during which period, noted cities, populous villages, exalted mosques, and stupendous pagodas, are seen just above the level of this temporary ocean, surrounded by innumerable boats, now the habitations of domesticated animals.

At this time, vessels even of an hundred tons are beheld traversing the country in various routes, wafted by a breeze that seldom shifts more than a point or two from South. The depth of water during the inundation, varies from ten to thirty feet, according to the undulations of the ground. The original course of rivers is now known only by their currents, which may have a velocity of four miles an hour, on an average, while the great body of water, spread over the plains, moves at the rate of half a mile or a mile in the same space of time.

A chemical analysis of the various impregnations and impurities which the Ganges and its contributory streams sweep down to Bengal, and which either subside in feculence on the soil, or are carried on to the sea, would form an interesting memoir;—it will be sufficient in this place to glance at a few of them.

The Western bank of the Ganges itself, between Hurdwar and Benares, consists in general of lime, concreted in irregular masses; and all the rivers which issue from the Western bank are more or less impregnated with the same substance; while on the opposite bank the waters partake of a strong solution of nitre, with which the plains of Oude, Fyzabad, and Gazeepour, abound. The country lying between the Ganges and the Goomty, on the Eastern bank, is replete with fossil alkali, named "seedgy," giving rise to severe bowel complaints among the natives; while the swamps of Sasseram are annually in a state of partial corruption, sufficient to occasion the most malignant diseases in the month of November, when the sun's power promotes an astonishing evaporation,

filling the air with miasmata, and spreading destruction among all the living tribes.

The Mahana, the Mutwalla, and various other mountain rivers, that rush into the Ganges between Patna and Boglepore, are frequently tinged with copper. The 12th Battalion of Native Infantry were nearly poisoned by drinking at one of these streams.

But it would be endless to trace all the sources of pollution in the vegetable and mineral kingdoms; one or two only in the animal kingdom will be selected as specimens in that extensive department.

The Hindoo religion enacts, that as soon as the spirit has taken its departure, the body shall be burnt on the banks of the Ganges, and that the ashes, together with every fragment of the funeral pile be committed to the sacred stream. In a country where dissolution and putrefaction are nearly simultaneous, the utility of such a measure is self-evident; but either from indolence or penury, the body is now generally placed on a small hurdle, and when little more than scorched, is pushed off from the shore with a bamboo, there to float until it arrives at the ocean, unless it be previously picked up by a shark or alligator; or, which is frequently the case, dragged ashore by Pariar dogs, and devoured by them, in company with a numerous train of carrion birds of various descriptions. From one hundred to one hundred and fifty of these disgusting objects may be counted passing any one point in the course of a day; and in some places where eddies prevail, a whole vortex of putrid corses may be seen circling about

for hours together! It was very common for us to be obliged to "clear the cable" occasionally, of a human body, speckled over by the partial separation of the cuticle and rete mucosum from putrefaction.

Each contributory stream brings down its full proportion of these ingredients to the general reservoir; since the inland inhabitants have always recourse to that which is most contiguous to their village; and strange as it may appear, where no stream is at hand, the nearest tank, or jeel, performs the vicarious office of the sacred Ganges, supplying drink for the living, and a final receptacle for the dead! We may add, that the banks of this river present, particularly about the rising and setting of the sun, a motley group of all classes, and sometimes both sexes, sacrificing to the Goddess Cloacina, in colloquial association; not indeed offering their gifts in temples, but committing them freely to the passing current.

So born and fed 'mid Tauran's mountain snows,
Pure as his source, awhile young Ganges flows;
Through flow'ry meads his loit'ring way pursues,
And quaffs with gentle lip the nectar'd dews;
Then broad and rough, through wilds unknown to day,
Through woods and swamps, where tigers prowl for prey,
He foams along; and rushing to the main,
Drinks deep pollution from each tainted plain.

I have remarked, that the ground springs a little near the sea, and by resisting the progress of the inundation, lays the more inland plains under water. This is an important circumstance in the medical topography of the country; since the more complete the inundation, the more healthy

are the inhabitants, till the fall of the waters in November and December exposes a number of miry and slimy marshes to the action of a still powerful sun, when those who are in their neighbourhood, are sure to come in for a share of remittents and intermittents.

It is worthy of remark here, that in those years, when the rains are late in setting in, many people are suddenly cut off by the intense heat of the sun in June and July. But this is nothing compared to the havoc produced by a sudden and premature *cessation* of the rains, or *Bursautty*, as they are called. In this last case an immense surface of slime and feculence is all at once exposed to the rays of a vertical sun, that has lost nothing of his power by a Southern declination. The consequence is, that the profuse exhalation of miasmata spreads pestilence and death in every direction; while famine, from the rice being left dry before it has attained maturity, completes the dreadful catastrophe!

But the sunderbunds, and the country, for some way round Calcutta, being in most places rather above the level of high water mark, become, during the rainy season, an immense woody and jungly marsh, neither perfectly overflowed, nor yet quite dry—in a word, presenting a surface as well supplied with animal and vegetable matters in a state of decomposition, and combining all the other circumstances necessary for giving miasmata their full influence on the human body, viz. intense heat, moisture, calms, &c. as perhaps any spot of equal extent on the face of the globe.

These sunderbunds form a belt between the Hoogly and the Megna of about 180 miles in

length, by 50 in depth, completely over-run with forests, underwood, and jungle; and inhabited by animals of various species, who are left to the uninterrupted possession of this frightful territory!

The rainy season commences about the middle of June, and lasts till the middle or latter end of October, though the waters are not drained off low situations till December. During this period, the deluges of rain that appear to come down occasionally "en masse" from the heavens, would almost stagger the belief of any one who had not witnessed them.

The inhabitants and domestic animals of inundated districts are all this time cooped up in a state of ennui, or torpor, which to an active European would be dreadful, had he not a number of mental, as well as corporeal resources for beguiling the tedious hours. But at Calcutta and Diamond harbour it is far otherwise. There the Europeans are not confined, and business must be attended to, as much as during the dry, or the cool and healthy season. It will not, therefore, appear extraordinary, that under all the circumstances related, the marsh remittent fever should make such ravages among all classes, but more particularly among those who are exposed to the sultry heat of the day,—the rains, the dews, and intemperance.

Having sufficiently explored the sources from whence vegeto-animal miasmata take their rise, I shall defer the investigation of their nature, or operation on the human frame, till the fever which they occasion is considered.

There can scarcely be conceived a situation of greater anxiety and distress, than that in which a young medical man of any sensibility is placed, on arriving at an unhealthy spot in a foreign climate, unfortified by experience, unaided by advice, and, as is too frequently the case, but scantily supplied with books, containing local accounts of the country and its prevailing diseases.

In such cases, he is forced to explore his way in the dark, agitated and alarmed by the mortality around him; a great share of which he attributes, perhaps with more remorse than justice, to his own misconduct, or ignorance of the proper treatment!

We arrived in the Hoogly, in the month of September, after a short run of little more than three months from England; which place we left without the least knowledge of our ultimate destination. The fever in question was then making prodigious havoc among the ships' crews at Diamond harbour, and other parts of the river; nor were we long exempted from its visitation. All circumstances considered, I thought myself fortunate in having in my possession, the works of two celebrated authors, (Clarke and Lind) containing a full account of this fever, drawn from personal observation on the spot. I accordingly

"Read them by day and studied them by night."

In short, I was quite anxious to grapple with this Hydra disease, and shew the power of medicine over this scourge of Europeans.

Many days did not elapse before I had an opportunity of trying my strength against so formidable an opponent, and a very few trials convinced me I had calculated without my host, and that I must use other weapons than those furnished me by Drs. Lind and Clarke, if I meant to be victorious in the contest.

Dr. Clarke's *description* of this fever, however, is so singularly chaste and correct, that were I to draw the picture myself, I must either use his own words, or give a false portrait. I shall therefore only add a few observations of my own in a note, and recommend Dr. C.'s description to be carefully compared with that of the yellow fever in another part of the work.

" This fever attacked in various ways, but commonly began with rigors, *pain* and sickness at stomach ; vomiting, head-ache, *oppression on the præcordia*, and great dejection of spirits. Sometimes, without any previous indisposition, the patients fell down in a deliquium, during the continuance of which the countenance was very pale and gloomy ; as they began to recover from the fit, they expressed the *pain* they suffered by applying their hands to the *stomach and head* ; and after vomiting a considerable quantity of bile, they soon returned to their senses. Sometimes the attack was so sudden, and attended with such *excruciating pain at the stomach*, that I have been obliged to give an opiate immediately.*

* It is a little singular, that Dr. Lind, of Windsor, in his Inaugural Dissertation on this Fever, never once mentions " oppression on the præcordia,"—" pain at the stomach,"— or " fullness and tenderness in the epigastric region." I can

"In whatever form the disease appeared at first, the pulse was small, feeble, and quick,—the pain at the stomach increased, and the vomiting continued. As the paroxysm advanced, the countenance became flushed—the pulse quick and full—the eyes red—tongue furred—thirst intense—head-ache violent, delirium succeeded, and the patient became unmanageable; but a profuse sweat breaking out in twelve or fourteen hours, generally mitigated all the symptoms.

"In the remissions, the pulse, which before was frequently 130, fell to 90. The patient returned to his senses, but complained of great debility; sickness at stomach, and bitter taste in

---

safely assert, that I seldom saw an instance in which all of these were wanting—seldom, indeed, an instance in which they were not all present. It is true, that this endemic is not always arrayed in the same colours; but the above-mentioned symptoms are so constantly attendant on fevers, in all hot climates particularly, that the omission of them is rather remarkable.

Dr. Lind mentions a symptom not noticed by Dr. Clark, and which I have often observed. After remarking that bile was frequently ejected both upwards and downwards, he says,—"Vomitus et dejectiones tamen *plerumque albi coloris erant*, calcis aquæ commistæ, vel lactis illius quod lactentes evomunt." Neither of them has mentioned delirium, as often the *first* indication of the fever. Many a time have I been called to see men, whom their messmates represented as "mad;" not in the least suspecting that it was the fever which they were seized with. This symptom generally happened among young men who were employed in boats, and who were not only more exposed than others to marsh effluvia, but to the fervency of the sun by day, and often to the dews and night air. A few instances likewise occurred where the patient attempted to jump over-board. This symptom is not very rare in bilious and other fevers, where there is great congestion or determination to the brain.

the mouth. This interval, which was very short, was succeeded by another paroxysm, in which all the former symptoms were aggravated, particularly the thirst, delirium, pain at the stomach, and vomiting of bile. If the disease was neglected in the beginning, the remissions totally disappeared, and the skin now became moist and clammy; the pulse was small and irregular, the tongue black and crusted, and the pain at the stomach and vomiting of bile became more violent." It is needless to say, that from this period till death closed the scene, the features of this fever were such as characterise the last moments of all violent and fatal fevers.

The unfavourable terminations were generally between the third and seventh day, though in some cases I have seen it go on to the fifteenth or twentieth day; but visceral obstructions were almost always the consequence; and hepatitis or dysentery completed what the fever failed to accomplish. I may add that several cases occurred under my own inspection, where there was a yellowish suffusion on the skin, as in the endemic of the West, with vomiting of matter bearing a considerable similarity to the grounds of coffee. This suffusion of bile, or yellow colour on the skin, is by no means an uncommon symptom in the fevers of the East, as will be shewn hereafter. The natives themselves frequently exhibit this appearance, when extensive epidemics prevail in the lower situations of Bengal, as appears by the following quotation, from Captain Williamson. "Certainly, (says this intelligent officer) it is "common to see whole villages in a state of *jaun-* "*dice*; and in some years the ravages of the

"disease (marsh remittent) are truly formidable." A torpid, or, at least, irregular state of the bowels, almost invariably precedes this fever; unless in cases where the effects of the paludal effluvia are suddenly brought out, by exposure to the intense heat of the sun by day, and the chilling dews and fogs of the nights, among boats' crews. In these, of course, there were few pre-monitory symptoms. In respect to the cure, Dr. Clark asserts, that "nothing is more indispensibly ne-"cessary in the beginning, than to cleanse the "intestinal tubes by gentle *vomits* and purges." * * * * * "As soon as the intestinal tubes have "been thoroughly cleansed, the cure must *entirely* "depend upon giving the Peruvian bark, in as "large doses as the patient's stomach will bear, "without paying *any regard to the remissions, or* "*exacerbations of the fever.*" Such are the plain and easy instructions which Drs. Clark and Lind have left for our guidance in this fearful endemic. They certainly are not, apparently, difficult to follow; and Heaven knows I endeavoured, most religiously, to fulfil every iota of their injunctions; but with what success a single case will shew.

A young man, of a good constitution, in the prime of life and health, had been assisting with several others, to navigate an Indiaman through the Hoogly. The day after he returned, he was seized with the usual symptoms of this fever. I did not see him till the cold stage was past; but the re-action was violent—the head-ache intense—skin burning hot—great oppression about the præcordia, with quick, hard pulse—thirst and nausea. An emetic was prescribed, and towards

the close of its operation discharged a quantity of ill-conditioned bile, both upwards and downwards; soon after which a perspiration broke out, the febrile symptoms subsided, and a remission, almost amounting to an intermission, followed. I now, with an air of confidence, began to "thrown in" the bark; quite sanguine in my expectations of soon checking this formidable disease. But, alas! my triumph was of very short duration; for in a few hours the fever returned with increased violence, and attended with such obstinate vomiting, that although I tried to push on the bark through the paroxysm, by the aid of opium, effervescing draughts, &c. it was all fruitless; for every dose was rejected the moment it was swallowed, and I was forced to abandon the only means by which I had hoped to curb the fury of the disease.

The other methods which I tried need not be enumerated: they were temporising shifts, calculated, in medical language, "to obviate occasional symptoms."

The plain truth was, that I knew not what to do; for the sudden and unexpected failure of that medicine on which I was taught to depend, completely embarrassed me, and before I could make up my mind to any feasible plan of treatment, my patient died, on the third day of his illness, perfectly yellow—vomiting to the last, a dark fluid resembling vitiated bile, and exhibiting an awful specimen of the effects which a Bengal fever is capable of producing, in so short a period, on a European in the vigour of manhood!

With feelings more easily conceived than described, I had the body conveyed to a convenient place, in hopes that dissection might afford some

clue to my future efforts. On laying open the abdomen, I was surprised to find the liver so gorged, as it were, with blood, that it actually fell to pieces on handling it. Indeed, it appeared as if the greater number of the vessels had been broken down, and almost the whole of the interior structure converted into a mass of extravasation. The gall-bladder contained a small quantity of bile, in colour and consistence resembling tar, and the ductus communis choledochus was so thickened in its coats, and contracted in its diameter, that a probe could scarcely be passed into it. Marks of incipient inflammation were visible in some parts of the small intestines, and the internal surface of the stomach exhibited similar appearances. The thorax was not examined, on account of the time taken up in getting at the brain. Marks of turgescence, in the venous system of vessels particularly, were there quite evident, and more than the usual quantity of lymph was found in the ventricles, but no appearance of actual inflammation.

This case requires little comment. It is pretty clear, that it would have required some ingenuity to devise a more injudicious mode of treatment, than that which I pursued. But it taught me an important lesson—it opened my eyes to my own folly, and, pace tantorum virorum, to the oversights of my teachers. It is but too true, that we are nearly as reluctant in acknowledging our failures, as we are forward in blazoning our successes. In so uncertain a science as that of medicine, this has always been a considerable obstacle to its progress and improvement; since, while we read of the great good fortune of others, and the surprising cures they have performed, and then

find our own so far deficient in that respect, even when we are carefully treading their steps, we despond, and become exceedingly sceptical in regard to the truth of those statements. These reflexions are not meant to bear on the veracity or candour of Dr. Clark, both of which I highly respect:—but as he has only published two unsuccessful cases —"in the most malignant fever he had ever seen in any part of the East Indies,"—viz. the Bengal fever, it may justly be questioned whether he would not have done more good, by detailing a greater proportion of the fatal terminations, than by confining himself to two solitary instances, without a single dissection. A careful perusal of the first of these that occurs on the list (Henry Pope, case 6,) will probably convince the reader that I was not the only person who had mistaken the nature of the disease, and that—

"Aliquando dormitat bonus Homerus."

In fact, the determination to the liver and the brain, is perfectly evident, from the beginning to the end of this case; and although no dissection took place, we cannot, for a moment, doubt the appearance which it would have exhibited.

The impression made on my mind, by the dissection on one hand, and the perusal of Dr. Clark's case (Henry Pope) on the other, determined me to try venesection, notwithstanding the dreadful accounts which Dr. C. himself gives of its fatal effects. I had now several down with the fever; and must confess it was with a trembling arm and palpitating heart, that I first opened a vein, expecting every instant to see my patient die among my hands.

He did not die, however; nay, he seemed evidently relieved, but the bad symptoms soon returned, and the bleeding was repeated, with brisk evacuations. He recovered.

I now carried the evacuating plan with a high hand, and with much better success than I expected. Fortunately for my patients, a great majority of them were fresh from Europe, and high in health and strength; these recovered wonderfully, after bleeding and evacuations, though not always.

But there was on board a class of men whom we had pressed out of ships on their return from India, who had experienced, not only the influence of the climate, but of depressing passions, arising from "hope deferred," and the galling disappointment they must have felt, while treading back their steps to a distant country, after they had been on the very point of mingling with their friends and relations at home!

These required a more discriminating mode of treatment. Evacuations at the very beginning were necessary; but something more was requisite, to clear the congestions from the head and liver. The fluids here, to use a simile, were too stagnant to drain off of their own accord, even when a sluice was opened—they required propulsion.

It would be humiliating to myself, and perhaps uninteresting to my readers, to enumerate the many glaring blunders which I committed, and the false conclusions which I drew, before I arrived at any thing like a steady and successful method of checking this Herculean endemic. Let those whose eagle eye and towering intellect can

penetrate, at a single glance, the secrets of nature, and curb with ease the reins of impetuous disease, place their hands on their breasts (if something within does not prevent them) and thank their God that "*they* are *not* like other men."

But to return to our subject. The first symptom that claims our most serious attention in this disease, is that irritability of the stomach, accompanied by a distressing vomiting. Till this is allayed, nothing can be done towards the cure, by way of medicine. Now venesection has considerable effect in procuring alleviation, even of this symptom. But the dribbling manner in which it is too often performed, when it is ventured on at all, does more harm than good. *Bleed boldly and decisively till the head and præcordia are relieved, or draw no blood whatever.*

While this is doing, a scruple of calomel, with half a grain or a grain of opium, should be immediately given; this will act like a charm on the stomach. I shall prove, in the course of this essay, what, indeed, is well known to many of my brother officers who have served in India, that twenty grains of calomel will act as a *sedative*, and so far from griping and producing hypercatharsis, it will sooth uneasiness, and rather constipate than purge. On this account, in the course of a few hours, when the vomiting is assuaged, some purgative must be given: cathartic extract, with calomel, castor oil, or even salts, which will seldom fail to bring away a most copious discharge of intolerably fœtid, bilious, and fæculent matter, to the unspeakable relief of the head and epigastrium.

If there be now a return of any of those dangerous symptoms, intense head-ache, delirium, or pain in the epigastric region, no apprehension need be entertained of the lancet once more.* Those bugbears, Debility and Putrescency, still paralise the arms of medical men in hot climates, notwithstanding the clearest evidence in favour of venesection, particularly where the subject is lately from Europe, and not broken down by the climate.

Immediately after the operation of the cathartic, the mainspring of the cure must be acted on. For this purpose, from five to ten grains of calomel, according to the urgency of the symptoms, combined with half a grain of opium, should be exhibited every four or six hours, till ptyalism is well raised; when, in nineteen cases out of twenty (I might say forty-nine out of fifty) there will be a remission of all the febrile symptoms, and safety secured. This is undoubtedly the sine qua non, in the medical treatment of this fever, as well as many other fevers in the East.

It is hardly necessary to remark, that emetics are exceedingly doubtful, if not prejudicial medicines in this endemic, since gastric irritability is one of the most distressi[ng] and difficult symptoms with which we have to contend. Yet many judicious practitioners, in the navy especially, still employ them, as will be seen hereafter; my own experience, however, and observations are decidedly against them.

* The jugular vein, where the head is oppressed, will be the best exit for the blood.

But, on the other hand, cathartics are eminently useful. There is, in this fever, either an obstinate costiveness, or dysenteric purging; no such thing as natural fæces, tinged with healthy bile, will ever be seen: when such can be obtained by purgatives, a great and evident advantage is gained. It may seem strange that I should recommend calomel and opium anterior to the administration of laxatives; but, independent of the necessity which there is of allaying the irritability of the stomach, whoever will compare the discharge procured by cathartics given *previously* to the calomel and opium, with that which follows the *subsequent* exhibition of them, will decide in favour of the latter plan.

Once every day then, the dose of calomel, usually given every four or six hours, should be conjoined with ten or fifteen grains of ex. colcynth. comp. jalap, or an ounce of castor oil, omitting the opium for that time. These will be sure to bring down a copious alvine evacuation, composed of highly vitiated bile and fœcal sordes, that had been lurking in the convolutions of the intestines and cells of the colon, during that torpid state of the bowels which generally precedes the attack of fever.

This will greatly relieve the oppression and tension of the epigastrium, as well as the headache; indeed so striking is the amelioration of symptoms, after these intestinal evacuations, that in two or three instances I was tempted to follow them up, and try if they might not supersede the necessity of impregnating the system with mercury. I trod here on tender ground; I was forced to measure back my steps, and have recourse in

the end to that powerful and invaluable medicine, but in one case it was too late! Warned by this, whenever I combined a purgative, with the calomel afterwards, I directed a mercurial friction or two to be employed during their operation, to prevent a halt in the pursuit of my ulterior and principal object—ptyalism.

In the mean time, while things are in this train, there are several objects which, though of a secondary consideration, the prudent practitioner will do well to keep in view. In the first place, the patient should be removed to the most airy and cool part of the ship or house; he should be made perfectly clean; and as there is in nine cases out of ten, a great determination to the brain, his feet may be immersed occasionally in warm water. His head should be elevated, shaved, and numerous folds of linen or cotton, moistened with vinegar and water artificially cooled, kept constantly applied to it.

Dr. Mc. Greggor remarks in his Medical Sketches, that the cold-bath did not succeed in the fevers of India. "On my arrival there "(says he) I tried it in several cases, but it "failed. This fever is commonly of the re-"mittent type, there is much reaction; it seems "in most cases *symptomatic of liver affection,* "*and often terminates in hepatitis.*" There is some obscurity in the latter part of this passage; but at all events, Dr. Mc. Greggor cannot allude to the fever under consideration, for although the liver, as I shall hereafter endeavour to prove, is in this, and perhaps in all other fevers, *affected*; yet it would be carrying a theory to extremes to assert, that the Bengal

33

Marsh Remittent, confessedly produced by paludal effluvia, in conjunction with heat and moisture, was, "in most cases *symptomatic* of liver affection." It is probable that Dr. Mc. Greggor had not an opportunity of seeing *this* fever; as his observation, in regard to "liver affection," applies more strictly to those fevers denominated "Bilious," which are prevalent at Bombay, the Coast of Coromandel, and other elevated parts of India, in which Dr. Mc. Greggor served.—Vide Sec. 2.

How far the cold affusion in these *last* fevers may be applicable, this is not the place to inquire; but in the Bengal Remittent, it has been practised, time immemorial, among the natives themselves, many a century before a Jackson, a Wright, or a Currie, ever thought or wrote on the subject, as the following quotation from a gentleman *out of the profession*, and who, of course, has no other object than truth in view, will prove.—"We must, "however," says Capt. Williamson, author of Oriental Field Sports, &c. "do the natives the "justice to allow, that the refrigerating principle, "lately adopted by some of our leading physi- "cians, owes its origin solely to the *ancient prac-* "*tice* of the Brahmans, or Hindoo priests, of "whom the generality affect to be deeply skilled "in pharmacy. I believe that, if taken in time, "few fevers would be found to degenerate into "typhus, and that very seldom any determination "towards the liver, in acute cases, would occur, "were the refrigerating course to be adopted. "Often have I known my servants, when attacked "with fever, to *drink cold water* in abundance, "and to apply *wetted cloths to their heads*, with "great success. The *former* has generally

"lowered the pulse considerably, by throwing out a "strong perspiration, while the *latter* has given "immediate local relief."—Vol. 2. p. 308.

I can confirm the truth of this, by experience, acquired long before I knew any thing of this native practice, and to which I was led by the unconquerable head-ache, heat, and throbbing of the temples, which nothing but venesection, and the cold ablutions abovementioned, would completely allay.

Mr. Bruce describes a somewhat similar practice among the natives of Massuah, a very unhealthy island on the borders of Abyssinia.—

"Violent fevers, called the *Nedad*, make "the principal figure in this fatal list, and "generally terminate the third day in death. "If the patient survives till the fifth day, he "very often recovers, by drinking water only, "and throwing a great quantity upon him, even "in his bed, where he is permitted to lie with-"out attempting to make him dry, or change "his bed, till another deluge adds to the first." Shaw's Abridgment, p. 156. Cold water, cold cungee water, or either of these acidulated with tamarinds, chrystals of tartar, or nitrous acid, will be found the most grateful beverage. But it is necessary to remark, that, till the irritability of the stomach is allayed, however urgent may be the thirst, the patient should be restrained from drink, especially in any large quantities. The cold ablution over the surface of the body will help to mitigate the thirst, till the stomach is tranquilised.

Large and repeated blisters to the epigastric region, will be found a most valuable auxiliary

to the above plan of treatment; and where torpor in the lymphatic system is evinced, by difficulty in affecting the mouth with mercury, the denuded surfaces should be dressed with mercurial ointment. With these means in use, I have generally awaited, with a kind of patient anxiety, the first symptoms of ptyalism; and on the third morning, I could frequently perceive a certain odour on the breath, prelusive of salivation. When this last came on *free*, I pronounced my patient to be secure.

But if no symptoms of saturation appeared, I have *then*, or indeed, if things wore an alarming aspect, I have sooner than this, either increased the doses of calomel, exhibited them at shorter intervals, or conjoined with them mercurial frictions. For if relief could not be procured on the third, fourth, or fifth day, the chance of recovery became smaller and smaller in proportion.

This relief sometimes preceded, sometimes succeeded; but was generally synchronous with the visible or sensible effects of mercury on the constitution, as evinced by the gums or breath. A mild and uniform diaphoresis, a refreshing sleep, and the appearance of natural stools, were the usual indications of this happy change; after which, as the ptyalism advanced, the train of morbid symptoms proportionally subsided, till at length the inability to eat, *in consequence of the soreness of the mouth*, became the principal complaint of the patient.

That there may be cases, wherein the use of wine, and even bark, is indispensible, I shall not attempt to deny. But the latter, in particular

I never had occasion to employ, except in cases of protracted convalescence; or to prevent relapses at the full and change of the moon, when such accidents are very liable to happen.

I have only to remark further, that when this fever was combined with dysentery, an occurrence by no means unusual, the same treatment, with the exception of cold external applications, conducted equally to a happy termination.

As the object of this Essay is Utility, and its design, to convey as much information on each subject, in a small space, as possible; it becomes a duty to notice in this place the opinions and practice of a very high medical authority in India—Dr. Balfour, whose abilities and experience entitle him to every respect.

I shall endeavour to condense his doctrine and directions into as few pages as I can, referring to his *second* Treatise on Sol-lunar Influence (Edin. 1790) where these are more explicitly developed than in any of his other publications.

Dr. B. considers the mild and regular intermittent, as well as the more violent and continued Bengal fevers, together with dysentery, as so many grades of the "*putrid intestinal remitting fever*," all of which he pronounces to be *infectious*. He conceives that the contagion proceeds from putrefying or putrid bodies, and which, passing down with the saliva, corrupts the mucus of the stomach and intestines. That *this* putrid matter being absorbed, and carried into the circulation, gives rise to, and accounts

for, the whole train of febrile symptoms. This is his theory, independent of "Sol-lunar Influence," which will be noticed hereafter.

With respect to the cure, he thinks that copious and continued purging would, in general, be sufficient to conduct mild cases to a successful issue; but as we are liable to much deception, he advises that in these, as well as in the most violent fevers of Bengal, after *two days* purging with calomel and other cathartics, to begin, on the *third* morning, to "throw in" the bark in substance, so as to administer two ounces in the course of forty-eight hours. At the expiration of this period, the calomel is to be again repeated at night, and a laxative the next morning; immediately after the operation of which, the bark is to be again reiterated for two days, and in the same manner as before. The purges and bark are thus to be alternated in exactly the above routine, till the disease is finally subdued. To give efficacy to this practice, a liberal use is to be made of opium, not only to keep the bark on the stomach, but to ease pain and procure rest.

With respect to those cases where there is *local affection*, Dr. B. only directs a superior degree of attention to be paid in guarding the body against cold, with occasional blisters and diaphoretics. In some rare cases, where the local affection is violent, he admits of bleeding, both general and local; but all the other plans are to be pursued in the manner prescribed, without any regard to paroxysms, remissions, or exacerbations, whatever.

These directions from the head of the medical department at Calcutta, might be supposed equivalent to the death-warrant of a mercurial practice, which almost excludes bark, and aims at exciting ptyalism as quickly as possible. Indeed, when I read these passages, I began seriously to consider, whether the impressions on my mind, which I conceived resulted from actual observation, were not the mere phantoms of imagination. In closing the book, however, my eye was attracted by the date of the *Preface*, which was fifteen years subsequent to that of the Treatise itself, viz. Calcutta, 1805.—

"Tempora mutantur, et nos mutamur in illis."

I was here not a little astonished—(to speak with candour, I was gratified)—to find Dr. Balfour "anxious that the young assistant surgeon "should, for some time after his arrival, *defer* "the investigation of *theoretical* questions, and "fix his attention on practical facts." But what was of more consequence, I found that, although Dr B. would not abandon his tried friend, bark, for mercury, he went half-way, and fairly offered a coalition.

"Considering," says he, "that obstructions "of the liver very frequently shew themselves, "in the common fevers of this country, and "may with great reason be suspected, in a cer- "tain degree, *in all*, we cannot hesitate to ad- "mit, as an essential and valuable principle, "in the cure of fevers, *the introduction of mer- "cury into the system, so as to affect the mouth*

"*in a moderate degree*, with the view of removing obstructions, or other morbid affections of "the liver; of obtaining natural secretions, and "of its thus contributing, *with the other means* "that have been described, to a speedy and "permanent cure." (Preface to a Collection of Treatises, &c.)

It is not a little strange, that Dr. Balfour should *now* conceive it necessary to add a new and a different practice to his own, which was *before* so pre-eminently successful, that the *combination* can hardly hope to rival it. "In the "space of twenty years (second treatise) I cannot say that I have met with *any case*, in "which I conceived bark to be properly administered, and in sufficient quantity, where it "*ever failed* of securing the patient in the end."

Some of the mercurial party will, no doubt, be malicious enough to insinuate, that after such a declaration as this, the formal admission of a *new*, is tantamount to a virtual renunciation of the *old* remedy.

I have thus given a fair view of two very different modes of treatment (and likewise their combination) in this dangerous disease. I have shewn my own preference for one of them, and I think substantial reasons for such: but I do not wish to blindly condemn the others, because I did not find them successful.

He who treads over the same ground which I have done, will, in every probability, have ample opportunities of putting them all to the trial, and then he may decide on their merits. But I would recommend him not to be too sanguine, nor condemn a practice from a few failures. It has not

been my lot to find intertropical fevers so very tractable as some of my brother-officers have, or say they have, found them. When we read of 118 cases of YELLOW FEVER cured out of 120,* many of us twinkling stars in the medical horizon, may well shrink into worse than insignificance, before a luminary that certainly shines,

——————Velut inter ignes
Luna Minores.——————

But such narrations, "while they make the vulgar stare, cannot but make the sensible grieve." They are too well calculated to create unfounded prejudices against the really meritorious, but *not quite so fortunate*, practitioner, in the minds of those who can seldom appreciate abilities, but by comparative success. When the latter is measured by such a standard as this, the conclusion drawn is obvious.

I should be sorry to suspect, much less accuse, any of my professional brethren of *wilful* misrepresentation; but when *young* medical men are setting forth their cures by a *new* remedy, we may at least be allowed to enter that remarkably significant, though apparently paradoxical caveat of Hippocrates—EXPERIENTIA FALLAX.

As the cold season approaches, the fever changes from an almost continued to a plainly remittent, and finally, in December, to an intermittent form. From this time, for two or three months, the climate of Bengal is cool and delightful; the only

* Currie's Reports, Vol. 2.

diseases being visceral obstructions, the sequelæ of the preceding endemic.

It has already been remarked, that this fever, when epidemic among the natives, occasionally commits the most destructive ravages. But the assimilation of their constitutions to the climate, their singularly abstemious habits, and various other causes, concur to shield them in general from its violence; so that it appears, for the most part, among this class, as an intermittent, but often of great obstinacy.

I have alluded to the *refrigerating practice*, which they have employed, time out of mind, in acute fevers: I shall now advert to some very efficacious native medicines, which they apply to the cure of this disease, especially when it manifests itself in the form of agues, which prove exceedingly troublesome to the inhabitants of villages scattered among the marshy, as well as hilly and jungly districts.

Their first object is the complete evacuation of all bilious and sordid colluvies from the stomach and bowels.

For this purpose, they have recourse to a black purging salt—*Bit-Noben*, or *Kala Neemuck*, a solution of which in water is certainly one of the most nauseous potations that can well be conceived, having an abominable taste, and a flavour resembling rotten eggs, or sulphuretted hydrogen gas. This medicine proves eminently cathartic, and powerfully emulges the liver and its ducts, carrying off vast quantities of vitiated bile, and other offensive fœcal matter, from the intestinal canal. This being effected, the kernel of a seed, produced by a low, creeping kind of cow-itch

(Cœsalpina Bonducella) called by the natives, *Kaut-Kullagee*, or *Catcaranja Nut*, is taken to complete the cure.

The kernel is intensely bitter, and possesses the tonic or febrifuge powers of Peruvian bark, in a very high degree. But it has a manifest advantage over the latter; for, instead of producing any constipating effects in the bowels, it, on the contrary, proves mildly laxative. It may be easily conceived that, in a tropical country, where the biliary system is so commonly deranged, such a qualification is of incalculable utility. One of the kernels, pounded into a paste, with three or four corns of pepper, and taken three, four, or five times a day, in conjunction with the decoction of Cherettah [Gentiana Cherayita] is found so generally successful in curing intermittents, that it is adopted by many European practitioners; and will probably, at no distant period, supersede entirely the bark, to which it seems infinitely preferable in a hot climate, on account of the aforesaid aperient quality.

The *Cherettah* is a species of gentian, indigenous in the mountainous countries north of the Ganges, and is to be procured in every bazar throughout Bengal. It possesses all the properties ascribed to the gentiana lutea, and in a greater degree than are to be found in the latter root as it comes to us. The decoction of this herb forms a powerful auxiliary to the caranja nut, and their united efficacy in curing intermittents is undisputed.

CAUSE OF FEVER.

It is now pretty universally agreed, that the *remote cause* of remitting and intermitting fevers, can be traced to vegeto-animal miasmata, or marsh exhalation; but the nature of this powerful, though invisible agent, is almost entirely unknown. With many of its laws and effects, indeed, we are well acquainted; but, like the matter of contagion, it has ever eluded the eye, and the investigation of the physician and chymist. These miasms arise from the wide-extended bosom of the earth, wherever animal and vegetable substances are lying in a state of decomposition; but in a tropical climate, where heat and moisture give, not only activity to the *agent*, but a predisposition for its reception to the *subject*, their united effects are tremendous!

It is scarcely worth while to notice the various conjectures that have been formed respecting the *nature* of marsh effluvium. A modern author supposes it to be the "exuberant principle of vegetation."

"It would appear," says Dr. Jackson, "that "the materials of vegetation abounding in excess, "acted upon by a powerful cause, give out a prin-"ciple, which, not being expended in the growth "and nourishment of plants, is diffused to a cer-"tain extent in the atmosphere, occasioning a de-"rangement of such bodies as come within the "sphere of its action."*

* Jackson on Fever, p. 105.

It is needless to say, that, allowing this to be the case, we are no wiser than before; since this "principle of vegetation" is just as inscrutable as vegeto-animal miasmata.

On the other hand, Dr. Currie,* an American gentleman, denies the existence of miasmata, and makes a diminution of oxygen and superabundance of azote in the atmosphere, the cause of remittents and intermittents in marshy situations. That nitrogen and carbonic acid gasses must be extricated, and abound, during the decomposition of vegetable and animal matters, cannot be doubted; yet few, I believe, will contend, that *disproportion alone*, in the component parts of the atmosphere, and not specific miasms, is the remote cause of fever.

Among the means of correcting this azotic atmosphere of marshy countries, Dr. Currie *seriously* proposes the extrication of oxygen from nitre!— "A large portion," says he, "of oxygen may be "furnished by the decomposition of nitre;—a "pound will furnish 800 ounces." Now, since Bengal produces as much of this article as most other places, it seems very strange, that the Honourable East-India Company have not, before this, taken the transatlantic hint, and purified the air of the Sunderbunds, by lighting up saltpetre bonfires along the banks of the Hoogly, from Saugur Roads to Calcutta.

But as the laws which govern, and the effects which are produced by marsh effluvium, are much more interesting than the most ingenious specula-

* American Philosophical Transactions.

tions respecting its nature and chemical properties, I shall confine myself principally to the useful and practical part of the subject.

Drs. Lind and Clark dwell much on the putrefying animal and vegetable substances left on the miry shores of the Hoogly by each retiring tide; attributing a considerable share of malignity to the noxious exhalations arising from this source, during the intervals of high water, both by day and night. The argument is more specious than solid; and perhaps it is not founded on accurate or discriminating observation.

During the months of August and September, for instance, when fevers rage with their greatest violence, the rivers are swelled to the summits of their banks by the inundation, and the volume of water disgorged into the ocean is so immense, that the stream is perfectly fresh, and the flood tide scarcely felt at Calcutta; consequently, the rise and fall are comparatively insignificant. But in May and the beginning of June, on the other hand, when the rivers are shrunk far within their autumnal boundaries; when the heat is excessive; and when the tides are so rapid, that the *bore*, as it is called, rushes up past Calcutta, sometimes with the amazing velocity of *twenty miles an hour*, not entirely stopping till it reaches Nia-serai, thirty-five miles above the capital; then, indeed, at low water, each side of the river presents a broad shelving slope of mud and mire, covered with vegeto-animal remains in all stages of putrefaction, and disengaging the most abominable stench,—yet no ill effects whatever are produced by such exhalations.

For the solution of this phenomenon, we must look to the tides themselves, which, sweeping along these shores every flood and ebb, never allow sufficient time for the extrication of that noxious effluvium, which arises from the *stagnant surface* of marshes, either *partially* covered, or just deserted by *annual*, not *diurnal* inundations. Such marshes [and jungles which produce a similar effect] spread far and wide in every direction along the banks of this river, during, and for some time subsequent to, the rainy season; to these, therefore, and not to daily overflowed places, are we indebted for all the sickness and mortality we so fatally experience.

Another circumstance may probably contribute its share in correcting these exhalations at the period alluded to. During the inundation, the waters of this river are quite *fresh*, though turbid; whereas, in the dry season, when the tides are strong, a considerable proportion of *salt water* comes up every flood, and renders the stream, even at Calcutta, so brackish, as to occasion smart bowel complaints among those who drink of it at this time. A mixture of salt water with fresh, therefore, does not, as was supposed by Sir John Pringle, *increase* the noxiousness of marshy exhalations; on the contrary, we find, in this instance, that they are quite harmless, while rising from these extensive shores, when the water is considerably impregnated with marine salt. In respect to the marshes that run back from the river, they cannot, *during the inundation*, be more subject to flux and reflux than the river itself. The shores of all inlets and minor streams are under exactly

similar circumstances to those I have stated of the Hoogly; and, finally, I may add, that it is the water of *inundations alone*, not tides, that ever bursts over the banks of the Ganges, to cover the adjoining plains; consequently the *marshes* are not subject to diurnal flux and reflux. I have been the more particular on this point, in order to set in a clear light the *validity* of those reasons which induced Dr. Lind of Windsor to read the recantation of his medical faith in *lunar influence*, in favour of "*the increased effluvia disengaged from the shores and neighbouring marshes at each retiring spring tide.*" Never was the fable of "dropping the substance to grasp at the shadow" more completely exemplified, than in this instance, which shews that "second thoughts are *not always* best." I much wonder that the ingenious Dr. Balfour, while lamenting the defection of his quondam supporter, did not adduce this unanswerable refutation, among others, of Dr. Lind's hypothesis.

In so luxuriant a climate as that of Bengal, and on so fertile an alluvion as the Delta of the Ganges, we may well suppose, that every spot,—almost every particle of matter, teems with animal as well as vegetable life. As the scale of existence descends, in the animal kingdom, the amazing circle of reproduction and decay is perpetually trodden by myriads of animated beings, whose ephemeral vitality has scarcely commenced, before it closes again in death! No sooner has the etherial spark—the "divinæ particula auræ," deserted its tenement, than the *latter* is resolved, by the heat and moisture of the climate, into its consti-

tuent materials, and formed without delay into other compounds:—

> "With ceaseless change the restless atoms pass
> "From life to life, a transmigrating mass."

It is during this dissolution of animal and vegetable remains, preparatory to new combinations and successive reproduction, that a certain inexplicable something is extricated, which operates with such powerful and baleful influence on the functions of the human frame.

This exhalation is capable of concentration, or rather accumulation; for when it is detained amid woods and jungles, as at this place, and especially during the rainy season, when there are no regular breezes to dissipate it, and when the beams of the sun are obscured, except at intervals, by dense clouds, it becomes exceedingly powerful, as the annual mortality too plainly proves.

That the exhalation of these miasmata, and their diffusion in the atmosphere, should be greater during the heat of the day than at night, when the air is raw and cold, appears more than probable; and yet an idea seems to prevail, that they arise from fens and marshes principally in the night. "The nature of an unhealthy, swampy soil," says Dr. Lind, "is such, that no sooner the sun-beams "are withdrawn, than the *vapour emitted* from it "renders the air raw, damp, and chilling in the "most sultry climates." It is difficult to imagine how dews *descend* and vapours *rise*, at the same time. Nevertheless, it is certainly true, that the stench emitted immediately after sunset, is

much more perceptible to the senses than at any other period of the day. The reason of this is, that the shores and marshes *retain* their heat for some time *after* the rays of the sun are withdrawn, and consequently *continue* to emit vapours, which are not exhaled and diffused through the atmosphere, as by the sun and high temperature of the day; they therefore meet the descending dews and cool air, condensing and forming a thick fog, which hovers over the swamps, accompanied by a noxious and disagreeable odour. To this we must add, that the miasmata exhaled during the day, in all probability descend with the dews of the evening, and by meeting and combining with those that *continue* to be disengaged from their source, must form a concentration highly capable of affecting the constitution.

We accordingly find, that four out of five of those who suffer, are attacked, or receive the deleterious principle, at the period abovementioned.

Experience has shewn that *marsh* effluvium, though by no means so limited as *human*, does not occupy a wide range: at least, it becomes innoxious at a certain distance from its source, in consequence of dilution. The circumstance mentioned by Dr. J. Hunter, and confirmed by subsequent observations—namely, that "the difference of a few feet in *height* gives a comparative "security to soldiers quartered in the same building," will be accounted for by the supposition which I have already stated, viz. *That as the miasms exhaled during the day descend in the evenings, they become more and more concentrated; till, meeting the exhalations from the still*

reeking marshes, a dense stratum of highly impregnated atmosphere is formed close to the surface of the earth. Hence the superior degree of salubrity in the *upper* ranges of buildings; and, on the contrary, the extreme danger of sleeping on the ground in such places; many instances of which are recorded in the writings of Lind, Bontius, &c. &c. &c.

I am the more inclined to believe that vegeto-animal miasmata descend with the dews, and are *then* more formidable than in their ascent by day, from a circumstance that occurred to myself in October 1805.

Having occasion to take a passage from Madras to Calcutta in a foreign merchantman at that time I sat late on deck, one evening after our arrival in the Ganges, the vessel being at anchor a mile from the shore, and not a breath of wind moving in any direction. As the dews began to fall, I perceived, all at once, a faint, heavy odour, to account for which I was much puzzled, as there was no breeze to waft any exhalation from the adjacent shores. My reflections were soon interrupted, however, by a sense of faintness, giddiness, and at length, nausea, with which I was suddenly affected. I immediately went below, not a little alarmed, and fully persuaded that I was seized with the fever, whose effects I had so much reason to dread. On drinking some warm water, to clear my stomach, I took a dose of calomel and opium, and next morning, castor oil. Although no farther symptoms of fever occurred, yet I felt an unusual degree of lassitude and depression of spirits for some days after I got to Calcutta.

The same is often felt on crossing the pontine marshes in Italy; and Dr. Moseley remarks, that he has felt a *shiver*, while passing the swamps to the west of Kingston, especially near the *ferry*, before the sun had dispersed the vapours.*

The following remark of Dr. Lind's is favourable to the supposition of miasmata descending with the dews: "The first rains that fall in Guinea are commonly supposed to be the most unhealthy; they have been known, in forty-eight "hours, to render the leather of shoes quite "mouldy and rotten." "It has been further "observed, that woollen cloths wet in those "rains, and afterwards hung up to dry in the "sun, have sometimes become full of maggots in "a few hours." It is natural to suppose, that whatever exhalations arose, and were floating in the atmosphere, previous to the rainy season, would descend with the first showers, on the same principle as the miasmata exhaled during the day descend with the dews of the night. †

* Page 52.

† In the months of September and October, 1799, while the Leopard and Centurion, two of Admiral Blankett's squadron, were working up from Mocha to Juddah, along the Arabian coast, they were considerably harrassed (the Leopard in particular) with a low fever, not of the remittent type, accompanied with great head-ache, weak, small, and quick pulse, pain at the stomach, and over the epigastric region, frequent bilious vomiting and purging, with uncommon debility and dejection of spirits. The days at this time were oppressively hot; the thermometer generally at 97°; the nights cool. But what was most singular, a copious fall of dew took place every night, *perfectly salt and bitter to the taste.* To this the fever was ascribed; and what corroborated the suspicion was, that the Leopard's crew slept exposed to the

41

This view of the subject leads to a practical inference of considerable utility, viz. that when necessity compels us to penetrate through those insalubrious woods, jungles, or marshes, we should select that point of time in which we are *least likely* to meet those miasms, whether in their ascending or descending state. This period seems to extend *from three to six o'clock in the afternoon*; that is, *after* the greatest heat of the earth and air, and, consequently, the greatest evaporation; and *before* the condensation and return of such exhalations as rose during the day, and which combine with those still issuing from the heated soil, for some time after sunset. It is but too well known, that the cool of the morning, of the evening, nay, in many instances, of the night, is generally pitched upon for wooding, watering, and other duties on shore, to the great risk of those concerned in such dangerous occupations.

An attention to the above rule [founded on facts as well as reasoning] would certainly be productive of much good; particularly when it is considered, that the human frame, during the portion of time above alluded to, is, perhaps, better fortified against the impression of marsh efflu-

---

nocturnal vapours, and suffered ten times the sickness which occurred in the Centurion.

In the latter ship no medicine was found to check the bilious purging and vomiting so well as calomel and opium. The addition of antimonial powder was afterwards made. When debility only remained, decoction of bark with nitrous acid, was found useful. In some cases, attended with great febrile stricture on the skin, the cold ablutions were used with success. In the Leopard some mortality prevailed.

vium, or other debilitating causes, than at any previous or subsequent period in the twenty-four hours. The seaman makes his principal meal at mid-day; he is then served his allowance of wine or spirits, and if a couple of hours rest is allowed at dinner, his energy and strength are much greater at three o'clock, than early in the morning or late at night. The European may object to this, by observing that the body and mind, recruited by sleep, are most vigorous in the morning. But I well know, from personal experience, that in tropical climates, and particularly during the rainy season, which compels all classes to pass the night between decks, the rest obtained from interrupted, I might say, stifled sleep, is very trifling. Indeed a general languor, lassitude, and want of appetite, prevail till towards noon, when dinner, wine, and an hour or two of repose, give a tone and activity to the system, which continue till the evening. This is the time, therefore, when we can resist the agency of marsh effluvium better than at any other, and of course should be selected, especially since it is at this period that the miasmata are most diffused through the higher regions of the atmosphere, and consequently less potent in themselves. The next three or four hours, viz. from six till nine or ten o'clock, appear to be pregnant with danger to those on shore. Within the tropics there is little or no twilight; immediately the sun withdraws his beams [six o'clock] every thing is involved in darkness; dews and vapours *fall* from the upper regions of the air, and exhalations still continue to spring from the tepid marshes to meet them. At this juncture, therefore, in the places and seasons alluded to, the stratum of

atmosphere in immediate contact with the surface of the earth, must be highly saturated with a principle but too destructive to human health and life; and the system is *then*, too, disposed to its reception, in consequence of the exhaustion produced by the heat and labours of the day, and the torpor induced by the coldness of the evenings.

This reasoning will be illustrated and confirmed by the following authentic particulars. In the month of November, 1804, two parties of men, belonging to His Majesty's Ship Tremendous, were employed on shore, at the Island of Madagascar; one party, during the night, filling water, the other cutting wood during the day. Four of the night party were attacked with the endemic fever of the country, and three of them died. The whole of the day party escaped the fever, though exposed to an intense sun, in the laborious occupation of wood-cutting.

About two years after this, His Majesty's ship Sceptre, in the same place, and upon a similar occasion, experienced a still greater disaster among her watering or night party, to whom the mortality was confined. Some interesting particulars respecting this fatal occurrence, I shall give in the words of the surgeon.

"The fever which attacked our watering parties at the Island of Madagascar, bears a striking resemblance to the endemic fever of the west;—like that too, it was not a contagious disease, of which we had the most cogent proofs, and corroborated what we witnessed at a former period. I believe that the exciting cause of this disease was confined to the scite of the watering place, as no person was affected upon the wooding party,

though *constantly exposed during the day.* The deleterious effects of nocturnal exposure were particularly exemplified here, by the disease raging most violently among the marines, who were on shore at night for the protection of the casks, and to whom the mortality was confined. The fever made its appearance among some of the same party who did *not* pass the night on shore, but in them it was infinitely milder, though similar in type and general symptoms. The watering place was encompassed from the sea by an amphitheatre of hills; and in nearly the centre of this ran the rivulet from which we filled, situated in a *marshy plain,* surrounded with some trees of the palm kind, and a thicket of *jungle.* The wooding place, on the other hand, was a *dry sandy soil,* though standing equally low, and covered with brush-wood, jungle, &c. in the same manner as the other. As the more minute features of the disease are described in the journal, I shall only remark, that it exhibited something of the remittent type, inasmuch as the paroxysms were more conspicuous and violent on alternate days; and on the intermediate, the system seemed less oppressed and more tranquil, with a different cast of features in the countenance; but there never was any thing like an apyrexia. The general treatment adopted in these cases, and which the journal developes, consisted in bloodletting, purging, and exciting ptyalism; the pre-eminence of which practice, several years experience in this country has amply confirmed. My sentiments have been so often expressed on venesection, that I need not repeat them. With respect to purgatives, I have always observed the greatest relief to follow, when they

took full effect. That they are beneficial in every stage of the disease, I infer from this ;—that the pulse, from being depressed, weak, and void of energy, becomes open, energetic, and bounding to the surface, with a corresponding animation in the countenance, after copious catharsis, even in the last stage of debility.

The next and only remedy, where bloodletting and purging do not check the disease at once, in its infancy, is mercury, to excite ptyalism. I say ptyalism, for *soreness of the mouth* will not secure the patient in this endemic. In many of the *fatal* terminations, the mouth was slightly affected ; but we never were able to excite ptyalism. Wherever this last could be induced, a revolution, as it were, in the whole train of morbid symptoms, instantly succeeded, and a healthy train supplied their place ! This revolution was most strikingly evinced in the functions of the bowels, by the evacuations becoming, all at once, copious and feculent ; a circumstance which, previous to ptyalism, no purgative, even of the most drastic nature, could effect."

Although the latter part of this document is foreign to the subject for which it was introduced, yet I trust it will be considered interesting. It is satisfactory to me, since it strongly corroborates what I have advanced lately on the treatment of the Bengal endemic, both in respect to bleeding and ptyalism ; the former being rather *heterodox* in India. I have only to remark, in reference to the striking coincidence of our practical views, that the above document was never penned for my inspection, nor that of the public. The sensible and well-informed author of it (Mr. Neill) is

alive, and can contradict any misrepresentation of his sentiments.

I shall here observe, once for all, that the foregoing remark will equally apply to all other documents and narratives introduced into this Essay, in addition to my own personal observations. They are strictly authentic; being the spontaneous records of facts, commemorated without preconceived theory or preconcerted design. I need not say how much their value is enhanced by this consideration.

In the account of the Batavian endemic, some other striking instances, corroborative of the opinions here advanced, will be related. In the mean time, the above examples will be sufficient to justify the rules I have laid down, and put future navigators on their guard, where disease and danger lurk in concealment.

And here I cannot help noticing the apathy or impolicy, which still allows Diamond Harbour, the principal anchorage of our Indiamen, to continue backed and flanked by woods, jungles, and marshes, to the annual destruction of one-fourth of the crews of such ships as load and unload at this place! The objection to clearing the Sunderbunds, has been founded on the idea of their presenting an impenetrable barrier to the incursions of an enemy from that quarter; but the Government does not seem to be aware, that to secure us from a *domestic* foe, it is by no means necessary, *in this instance*, to throw open the way to a *foreign*. A semicircle of cleared and drained ground, even of six miles in radius, [not a thirtieth part of the Sunderbunds, and scooped as it were out of their centre] would sufficiently protect the anchorage

and warehouses of Diamond Harbour, from the baleful influence of those exhalations we have been describing

That the woods and jungles might be cleared, admits of no doubt; and that the country round Diamond Point might either be drained, overflowed, or submitted to the flux and reflux of the tides, any one of which measures would afford comparative security, can hardly be denied. To add to this security, one or two narrow semicircular belts of wood might be interposed between Diamond Harbour and the confines of the cleared space, to arrest any effluvium disengaged from the surrounding wilds or marshes, and conveyed by the breezes towards the aforesaid anchorage. All writers agree, that marsh miasmata, although much less limited in their range than the matter of contagion, would be perfectly harmless after traversing a much shorter route than that proposed; but where native labour can be so easily procured; indeed, where the convicts alone would be equal to the undertaking in a very few years; and finally when it is considered, that this salutary step opens not any facility to the irruption of an enemy on the southern frontier of Bengal, we can hardly doubt that the attention of the Company will, ere long, be directed to so important a measure. Till then, we can only remark, that the farther from shore, and the lower down the river ships lie, so much more healthy will be the crews. On this account Saugur Road is more eligible, in regard to salubrity, than Kedgeree; and the latter much less dangerous than Culpee or Diamond Harbour. This was amply proved by the comparative mortality in the Caroline, Howe, and Medusa frigates,

45

The two latter, by anchoring higher up than the former, lost at least six times as many men, from fevers and fluxes. Indeed, one was obliged to take a cruise to sea, and the other to retreat back to Saugur Roads, to avoid depopulation! Some suggestions will be given hereafter, in regard to the means of obviating the effects of marsh effluvium, even at Diamond Harbour, the focus of this destructive principle.

In what manner, or through what channel it is conveyed to the sensorium, so as to produce its effects on the constitution, we are nearly ignorant. A general idea prevails, that the stomach is the medium through which the matter of contagion acts; and, by analogy, that marsh miasmata take the same course. But when we consider, that at each inspiration the atmosphere impregnated with this principle is largely applied to the delicate texture of the lungs, it is not difficult to conceive, that it may pass into the blood, [if it is in any case absorbed] as readily as oxygen. There are, besides, the schneiderian, and other membranes of the nares and fauces, to which it must have constant access, while there is but one way for it to pass into the stomach, viz. along with the saliva or food. Further, when we see this principle, in a concentrated state, produce fever in a very few hours, with high delirium, can we suppose that it enters the system by the circuitous route of the alimentary canal and lacteals? If it be said that it acts through the medium of the nerves of the stomach, why not through that of the olfactory, which is a shorter road? Indeed, from a near view of its *effects*, there is every reason to suppose

that the brain and nervous system suffer the first impression and shock. To these *effects*, then, we are to direct our attention.

I believe it is nearly a unanimous opinion, at present, that both marsh and human effluvia are directly sedative or debilitating in their nature. Dr. Rush, indeed, uses the term, "stimulus of contagion" in almost every page of his work on Yellow Fever; but, like the more celebrated "stimulus of necessity," it may be quietly laid in the "tomb of all the Capulets." By Dr. Jackson, the cause of fever is compared to electricity. "It seems to accumulate in the system "by a regular but unknown process: in a certain state of accumulation, it seems to explode "in a manner similar to the explosions of electricity."* The delirium and violent action early apparent in the jungle fever, might countenance the idea of a stimulus, and that the subsequent debility was of the *indirect* kind. I have heard this opinion maintained on the spot, by medical gentlemen; but if we narrowly inspect the train of morbid symptoms, we find more of *irregular* than *increased* action; more of apparent than real strength. If we carefully observe the delirious patient, writhing and struggling under the first impression of this cause, we find the efforts not only momentary and less effective than healthy exertions, but accompanied, even at the instant, and immediately succeeded by tremor and other marks of debility. The premonitory symptoms too, are all indi-

* Outlines of Fever, p. 247.

cative of decreased sensorial energy. The mind is wavering and unsteady; the appetite languid; the secretions, particularly the biliary, diminished; and the bowels torpid. Notwithstanding the determined phraseology of Dr. Rush, therefore, we may still adhere to the opinion of the venerable Cullen, that marsh, as well as human effluvium, is *sedative*. Dr. Jackson, indeed, will not allow it to be either stimulant or sedative, but a kind of *irritant*; yet he gradually slides into the admission of its sedative nature: "It however appears, from the "most general view of things, that the febrile "cause is a cause of irritation, disturbing, but "*not increasing* in a natural manner, the action "of the moving fibre. On the contrary, interrupting, impeding, and as it were *suspending* "the operation essential to health and life; by "which means the expression of its effects "principally consists in *debility and impaired* "*energy*."*

The space of time which intervenes between the application of this poison to the system and its ostensible operation in the form of fever, depends on the degree of its concentration, and the predisposition of the patient. It will, for instance, be found in some places so powerful, that a man in perfect health, by remaining on shore during the night, in marshy situations, and wet or autumnal seasons, shall have the fever violently the next day, and die on the third or fourth. On the other hand, it may be

* Outlines of Fever, p. 252.

applied in so dilute a state, as to require eighteen, twenty, or even thirty days,* to bring on fever; and even then, perhaps, only in consequence of some of the numerous predisposing or *auxiliary* causes concurring to enable the *original* to develope itself. If we take the medium of these two extremes, we shall have the ordinary period, viz. twelve or fourteen days, which elapses between the reception of vegeto-animal miasmata into the body, and their manifestation, in the shape of actual disease.

We see, then, this important agent greatly varying in force; and from standing occasionally the unaided *principal*,—the "instar omnium," in the production of fever, dwindle away till it can scarcely be distinguished, at least not prominently so, among the train of *auxiliaries*.

Such being the case, is it not possible that where the *latter* are numerous or powerful, they may, in some instances, induce the aforesaid disease, without the assistance of marsh exhalation?

* Dr. Jackson says two months, and Dr. Bancroft nine or ten.

PREDISPOSING AND EXCITING CAUSES.

We now come to the Predisposing or Exciting Causes, which are entitled to an equal, if not a superior degree of attention, to that which has been bestowed on the remote.

These may be divided into mental and corporeal. Of the former, none are so conspicuous as the *depressing passions*; and of these Dr. Clark informs us, that FEAR produced the most striking and sudden effects, in aiding the remote cause of fever. This may, in some measure, account for the ravages which the yellow fever commits among newly arrived Europeans, who are prepossessed with the idea and dread of this terrible scourge.

I have, indeed, remarked that most of those, who were of a timid disposition, and easily alarmed at the prevalence of the endemic diseases of the country, fell under their influence sooner than those of a contrary temperament. But grief, disappointment, and chagrin were the depressing passions, which universally induced the most decided and unequivocal predisposition to disease. I saw many strong and melancholy instances of this among that part of our crew, which we pressed within sight of their own shores, and probably of their own habitations, when we were commencing our voyage to India. They were among the first and worst cases which I had under my care, and afforded ample proofs, that mental despondency can ac-

celerate the attack, and render difficult the cure, of intertropical fevers in particular. I have since seen the influence of this predisposing cause on a large scale;—not on the banks of the Ganges, but much nearer home—on the banks of the Scheldt.

When our army lay entrenched under the walls of Flushing, without any other defence from the sun, the rains and the dews, than some brushwood or straw;—generally, indeed, with the humid earth for their beds, and the canopy of heaven for their curtains; still, with all these disadvantages, the animating prospect of success, the mental energy inspired by *hope*, united with corporeal activity, kept the whole army in health. When Flushing surrendered, however, and another object was not *instantly* held out for pursuit or attainment, a fatal pause took place, and a kind of torpor, or rather exhaustion ensued, during which, the remote cause of fever, viz. vegeto-animal miasmata, began to make some impression. But when from the ramparts of Batz, we clearly discovered with our glasses a strong boom crossing the Scheldt from Fort Lillo,—the surrounding country in a state of inundation, and various other insuperable obstacles between us and the "*ulterior objects*" of the expedition;—then, indeed, the depressing passions, and some other predisposing or exciting causes communicated a fearful activity to marsh effluvium, which rivaled in its effects, any thing that has been seen even in tropical climates!

It is an old complaint, that the medical topography, and healthy or unhealthy seasons of a

country, are too often neglected in military and naval operations. Yet one would suppose that within sixteen or eighteen hours communication of London, every medical and political expedient would have been speedily devised and applied, on such an emergency as this. But certain it is, that the army did not avail itself of some local advantages that presented themselves among these noxious islands. Walcheren, for instance, is bounded all the way round from Flushing by West Chapel, nearly to Camp Vere—two-thirds of its circumference, by a chain of sand-hills, from twenty to thirty feet in elevation above the level of the interjacent plains. These hills were not only dry, but open to the westernly winds which blew from the sea, and were then very prevalent. On these, therefore, had the soldiers, who *continued* in Walcheren after the fall of Flushing, been *tented*, the elevated scite, combining with other local peculiarities, would, in all probability, have kept them entirely out of the range of those exhalations which covered the country below.

On the other hand, although Beveland did not present such a favourable situation to the rest of the army, yet, had they been provided with *tents*, the numerous mounds or embankments, which not only defend the island from the highest rise of the Scheldt, but intersect the country in every possible direction, frequently planted on each side with trees, and raised twelve or fourteen feet above the surface of the soil, would have afforded excellent encampments, where the men, under the immediate inspection of their officers, would have been se-

cured from intemperance and other irregularities, the inevitable consequences of being quartered in towns and villages, often in churches, barns, and other damp, unhealthy habitations, throughout Walcheren and Beveland. But, unfortunately, *tents* were not considered a necessary part of the baggage on this expedition. The French general, too, having opened the sluices, and *partially inundated* the country round Flushing, increased the force of the endemic. Indeed, the road leading from the last-mentioned place to Middleburg, might at this time vie, in respect to insalubrity, with any through the pontine fens of Italy. Lenity towards the *inhabitants* arrested the progress of the inundation before it was complete; policy in guarding the health of *our own army*, would perhaps have suffered it to continue till the cessation of the autumnal heats, and the commencement of cold weather and frost.

Nothing could more clearly prove the limited range of marsh effluvium, than the contrast between the health of the navy and that of the army. Although the ships were distributed all along the shores of Walcheren and Beveland, from Flushing to Batz, most of them within a cable's length of the banks, yet no sickness occurred, except among such parts of the crews as were much employed on shore, and remained there during the nights. Most officers of ships, and many of the men, were in the habit of making excursions through all parts of the islands, by day, with complete immunity from fever. The night was here, as in sultry climates, the period of danger.

One more remark shall close this digression. We all remember the popular, or rather political outcry, that was made about the scarcity of bark: had the lancet, aided by calomel, and occasionally by jalap, been judiciously, but boldly and decisively employed, the physicians of London and Edinburgh would not perhaps, since that period, have been so often consulted for indurations and obstructions in the liver and spleen, with many other melancholy sequelæ of that destructive fever!

But, to return. One would suppose that, in a tropical climate, where nature is ever arrayed in her gayest livery, the cloudless skies above, and exuberant fertility around, would conspire to impart a degree of elasticity (if I am allowed the term) and exhilaration to the mind, similar to what we feel in Europe, at the approach of spring or summer. The reverse of this is the case. The animal spirits are, in general, below par; and the same cause of grief or disappointment, which in England would be borne with philosophical resignation, or perhaps indifference, will, in India, greatly predispose to all the diseases of the country, and very probably terminate the mortal career of the unhappy object.

The following melancholy facts are strikingly illustrative of this remark. His Majesty's ship Russel (74) sailed from Madras on the 22d. October, 1806, and arrived at Batavia on the 27th November; the crew healthy, and their minds highly elated with the sanguine expectations of surprising the Dutch squadron there. Such, however, was their sudden disappointment, and concomitant mental dejection, on missing the object

of their hopes, that they began immediately to fall ill, ten, twelve, or fourteen, per day, till nearly 200 men were laid up with *scurvy*, scorbutic fluxes, and hepatic complaints! Of these, upwards of 30 died before they got back to Bombay, and more than 50 were sent to the hospital there. The Albion did not fare better—the Powerful fared worse: so that, in these three ships only, in the short space of a few months, *full 100 men died on board*, and double that number were sent to hospitals, many of whom afterwards fell victims to the diseases specified; aggravated, and in a great measure engendered, by mental despondency.

Numerous are the instances of a similar nature, though on a smaller scale, which I could relate; but the above specimen is sufficient. The converse of this position is equally surprising: thus, success or good fortune will as forcibly counteract, as the contrary will predispose to, the malignant effects of climate. A familiar example will elucidate this.—Two ships, under equal circumstances, sail from Bombay, on a five months cruise off the Isle of France. One of them takes a valuable prize, while the other, with every effort and vigilance, is quite unsuccessful. The minds of the former crew are now perpetually employed in "building castles in the air," and forming the most extravagant anticipations of enjoyment on their return to port. This ship's company, without the aid of a single bottle of lime-juice, or pot of spruce, will come back to Bombay at the end of the cruise in health. Not so the other: chagrin, envy, (for, after all the *poetical* portraits that are drawn of our noble tars, they are both envious and jealous at times, like other folks) and various

depressing passions, shew themselves here, in the ugly shapes of scurvy, ulcers, and fluxes; so that, in spite of all the artificial checks from lemon-juice, sugar, porter, and even NOPAL itself, they are forced to Madagascar for refreshments, or else return with the other ship to Bombay, in a deplorable condition.

Here, however, the scene shifts again; for Hygeia is as fickle as Fortuna. The crew of the successful ship having shared their prize-money,

"Balnea—Vina—Venus,"

become the order of the day; and, for a short time, they are at the summit of human happiness! But in a few weeks, on *leaving* port, this ship's company will exhibit as long a list of fevers, dysenteries, and venereals, as the other did of scurvies, ulcers, and fluxes, on *arriving*. Thus prize-money, or rather the hope of prize-money, is one of the most potent antidotes to disease among sailors at sea, but the most certain bane of their health on shore.

To return. This mental despondency may be attributed partly to physical, and partly to moral causes. I have already hinted that derangement in the *hepatic* and *digestive*, very soon affect the *mental* functions; so, on the other hand, the depressing passions speedily derange the biliary secretion, digestion, and peristaltic motion of the intestines, consequently disposing the liver, stomach, and alimentary canal, to disease, as well as inducing general debility throughout the system. This sufficiently accounts for the phenomenon; but it is also to be considered, that grief and

disappointment must be *ceteris paribus*, more poignant in India than in England; since the loss of friends or relatives is more felt, in proportion to the small number we possess; and frustrated expectations will, of course, be more galling on account of the previous sanguine hopes which always accômpany a foreign, and particularly an Indian speculation. We may therefore lay it down as an axiom, that in a tropical climate, the depressing passions above alluded to, operate more immediately on those organs which, under all circumstances, are the principal sufferers in the diseases of the country; viz. that they diminish the mental energies, or sensorial power, and impair the functions of the liver, stomach, and intestinal canal.

Within the torrid zone, philosophy seems to direct her influence, and reason its arguments, in vain, against these powerful disorders of the mind! Their frigid tenets are more efficacious beneath the gloomy skies of Europe. Religion, indeed, frequently asserts her superiority here, as well as elsewhere; and in conjunction with some pursuit or employment, mental or corporeal, will be found the best shield against the demon of despair, and, ultimately, the pangs of disease.

The destructive effects of intemperance, as a predisposing cause, are equally conspicuous, and I might say peculiar, in a tropical climate; for the injuries it occasions in Europe, great as they are, bear no proportion to those which we witness in the East or West Indies. Whether spirituous and vinous potations act as stimulants or sedatives, or both in succession, we need not stop to inquire, since the final result is universally allowed to be debility. From the temporary increase of excite-

ment in the system, and energy in the circulation, it is not impossible that the biliary secretion is for a short time augmented, and of course vitiated, by strong drink. This supposition is strengthened by the diarrhœa crapulosa which we frequently observe succeeding a debauch. But the great mischief seems to arise from the torpor communicated to the liver, through paralysis of its ducts, by which the secretion of healthy bile is not only greatly diminished in quantity, as well as obstructed, but deteriorated in quality; and hence the way is paved for fever, dysentery, and hepatitis.

The debility of the stomach, too, occasioned by the climate, is further increased by inebriety; and this atony is readily communicated to the liver, which bears the onus of disease in all hot climates.

The truth of these observations is amply exemplified among the crews of ships, when they have liberty to spend a few days at Calcutta, or go ashore, indeed, in any part of India, where intoxicating liquors are to be procured. During the indirect debility succeeding these debauches, the endemic of the country or port makes rapid strides among these deluded victims, converting what they erroneously conceived an indulgence, into the greatest evil that could have befallen them.

For obvious reasons, intemperance in eating is little less destructive than the other species; since an overloaded stomach, which has previously been weakened, will of itself excite a temporary fever, and consequently predispose to that of the country.

That fatigue, especially during the heat of the day, becomes an exciting cause of this fever, is well known to those who have observed its ef-

fects among the seamen employed in stowing the saltpetre, and loading or unloading the Company's ships at Diamond Harbour. Where those laborious occupations *must* be carried on by Europeans, they certainly should not take place between eleven o'clock and four in the afternoon; the interval ought to be dedicated to dinner, rest, and light work under the awnings.

A very common, and powerfully predisposing cause of this fever, has seldom been adverted to, though highly deserving of attention.—I mean those licentious indulgences which are but too easily procured, and too frequently practised on the banks of the Ganges, and in most other parts of India—I may say of all tropical climates! I have seen many melancholy instances of their pernicious effects; and therefore it is incumbent on commanding officers of ships, to keep as strict a curb as possible on the men, during the sickly season, and on no account whatever allow them to straggle through the villages, where inebriety, and that too from a very deleterious species of drink, is an inseparable accompaniment to the illicit amours abovementioned. In every region virtue is its own reward; but within the torrid zone, its breach is more signally punished than in any other.

The last exciting cause which I shall mention, is the influence of the sun and moon. However sceptical professional men in Europe may be, in regard to planetary influence in fevers, &c. it is too plainly perceptible between the tropics, to admit of a doubt. I have not only observed it in others, but felt it in my own person in India, when labouring under the effects of obstructed liver.

Sol-lunar Influence.

It is a certain fact, that if we attend minutely to the state of our own frames and sensations, two, if not three slight febrile paroxysms, may be detected in the course of each diurnal revolution of the earth, independent of those which succeed full meals. In high health we may not be able to distinguish more than the nocturnal paroxysm, which commences about seven or eight o'clock in the evening, and is not over till two in the morning. This is the cause of that furred tongue, which all may observe on getting out of bed, more or less, according to the degree of the paroxysm; and it likewise explains the evening exacerbation of fevers in general. But valetudinarians will feel, about mid-day, another slight febrile accession, similar to the preceding, except in degree; and in some instances a third, but still slighter one, is felt between eight and ten o'clock in the morning. In India I have felt the two former very distinctly, and particularly at full and change, when I used to be affected with tremor, a sense of weakness, and sometimes a dimness of vision about mid-day, succeeded by a certain quickness and irritability of pulse, which would continue for an hour or two. I was so well aware of this, that I made a point of keeping myself quiet, and as cool as possible, about the abovementioned period; since any exertion at that time, in the heat of the sun especially, increased the symptoms which I have described, in a very considerable degree. I believe this is the case with most people, more or less, and accounts for the general complaint of faintness about twelve o'clock in the day, and which is relieved by a glass of wine or other refreshment. I found the cold bath, where I could conveniently apply it, almost

entirely *prevent* this paroxysm, and hence the utility of bathing when the sun is at his greatest altitude. At those times too, my sleep was broken and disturbed with dreams, and a feverish heat towards midnight, all of which would go off about two o'clock in the morning. This accords with the general remark, that the morning repose is the soundest, and that if dreams do then occur, they are more distinct and better remembered than those which take place *during* the nocturnal paroxysm. It is very natural to attribute such regular and periodical changes or feelings in the human frame, to the revolutions of the planet we inhabit, and the influence of the sun and moon. That this influence predisposes to, or exacerbates the paroxysms of fever, in India and other tropical climates, is incontestibly proved by daily observation, as the publications of the ingenious and respectable Dr. Balfour evince. But when we find a modern physician* extend this influence not only to every species of disease in temperate climates, but to life, death, birth,—nay, even conception itself!—when we see him harrow up the dreams of the ancients, to give weight to the waking reveries of his own imagination, then, indeed, we may expect to have the whole theory turned into ridicule. Who, for instance, but Dr. Moseley, in turning over the pages of Aristotle and Pliny, would thus cruelly

> "Draw forth their frailties from their dread abode.

and exhibit such passages as the following?

* Vide Moseley on Tropical Diseases, 4th edition.

"Aristotle observes, that *no animal dies* but at "the time of the *reflux or ebbing of the tide.* "It has, he says, been much remarked on the sea "coast of France, but found by experience to ex-"tend *only to the human race.*"* "Some cu-"rious investigators, says Pliny, *have discovered* "that the fibres or streaks in the livers of rats, "answer in number to the days of the moon's "age; and that the little creature, the ant, feels "the moon's influence, and never works at the "time of the change."† Aulus Gellius is likewise a *lunarian.* He remarks, "that those things "which increase with the moon, decrease with "her; that the eyes of cats are larger or smaller, "according to the moon; but that onions" [the only rebels in the vegetable world,] "put out "their buds in the *decrease* of the moon, and "wither in her *increase,*" [how perverse!] "con-"trary to the nature of *every other* vegetable pro-"duction." But poor Pliny is destined to put the cap to this climax of absurdities. "The moon, "says he, is *truly* conjectured to be a *spirit.* By "this she saturates the earth; in her increase she "replenishes bodies, and in her decrease empties "them again. *Therefore* all shellfish increase "with the moon, and those *animals which have no "blood most feel her force.* The blood in human "beings is augmented and lessened with her light. "She turns to corruption the slain carcasses of "wild beasts, if she shines upon them; she thaws "ice; and with her moistening breath enlarges "all things."..Finally—"The moon is nourished

* Tropical Diseases, p. 577. † Ibid.

"by the fresh river waters, as the sun is fed by "the sea!" p. 577-8. These few passages, taken at random out of *twenty octavo pages*, filled with similar erudite quotations from the ancients, equally interesting and instructive, may well excite our astonishment, how any man, not actually in a state of *lunacy* himself, could wade through such a sea of learning, in search of crude errors, puerile fancies, and absurd suppositions, that would disgrace the most superstitious legend of monkish ignorance! This may teach us how useful an auxiliary to erudition is a modicum of common sense.

Of Dr. Moseley's own opinions, and those of post-barbarian physicians, occupying *fifty pages* more, I shall take little notice. They only prove to us, that this same *lunacy* is not confined to the ancients alone. Conception, for instance, an operation which we short-sighted terrestrials hitherto attributed to the *fixed laws* of Nature, appears, according to the lunarian account, to be regulated by the moon. But on this point Dr. Moseley archly insinuates, perhaps for wise purposes, that he has by no means unlocked *to us* the whole store of his *occult* knowledge; as is pretty evident from the significant innuendo conveyed in the following sentences, both prosaic and poetical: "Much "might be said here," continues the doctor, "if "*individuals*, and not Nature, who is never *desti-* "*tute of heirs*, were the theme of our *Treatise*.

"There are more things in heaven and earth,
"Than are dreamt of in our philosophy."—p. 634.

Now if this hint be not sufficient to excite the attention of sexagenarian Lotharios, who are anxious to perpetuate their names by legitimate

offspring, I know not what will. Certain females too, of unpromising fecundity, who have long tried all means of getting into that happy state, in which

> "Ladies wish to be, who love their lords,"

come under the head of these *heirless individuals*, above alluded to; and since the *Treatise* is not the proper place to unfold secrets, we may naturally conclude that Chelsea is the astrological dispensary for distributing and directing this planetary influence to certain important *ends and operations*, far beyond the control of any but initiated lunarians.

THEORY OF FEVER.

After having detailed, pretty fully, the remote and predisposing causes, the symptoms, and the modes of treating this endemic, all which may come under the head of "Practical Facts," I might fairly claim the indulgence of a few pages for theory. But conscious how unprofitable, however prolific, are, in general, the flowery fields of speculation, and knowing what ample and useful materials remain for arrangement within the narrow limits which I have prescribed to this Essay, I shall pass with hasty steps through this fairy region; or, like Ulysses, binding myself to the mast of observation, to avoid as much as possible the syren voice of theory, confine my efforts to an attempt at explaining the more prominent features of the "Ratio symptomatum" in this fever; aware that, although the undertaking may be deemed presumptuous, the failure, for obvious reasons, cannot be considered disgraceful.

First then, we need not be ashamed, however unfashionable it is, to conclude with the immortal Cullen, that the remote cause of this fever, as well as that from contagion, is a sedative. That its application or reception diminishes the sensorial energy. That the power of the heart and arteries is first weakened, the consequence of which is, an inability to propel the blood to

the surface; hence the quiescence of the capillaries, the shrinking and coldness of the external parts, *without the intervention of spasm*. In this state it follows of course, and is allowed by all, that the blood is confined to the heart and large internal trunks of vessels. But this does not appear sufficient to account for the swelling, tension, oppression, and even pain about the hypochondria, as well as many other of the symptoms attendant on the cold stage in particular. If, during the latter, I place my finger on the radial artery, and endeavour to estimate its calibre, and the quantum of blood transmitted through it in a given time, compared with what takes place in the hot stage, or even in health, I shall conclude that the artery is not then above one-third the size, nor the quantity of blood passing through it more in proportion. Such being the case, it is difficult to conceive how the whole mass of blood can be in *actual circulation* at this time. In addition, therefore, to the confinement of a large share of it to the heart and great vessels, where its motion must be slow, I suppose another considerable portion of it to be *arrested*, as it were, and accumulated in certain situations, where it remains, pro tempore, *out of the course of the circulation*. This congestion, or complete quiescence, takes place in the *portal circle*, where the blood is at all times languid in its current, there being no *vis a tergo*, and but little muscular propulsion. The consequence of this must be, that not only the liver and the various branches of the vena portarium will become turgid, but also the spleen [which returns its blood to the heart through this

channel] the stomach, pancreas, and intestines, will feel the effects of this turgescence. If it be asked, why the blood should cease to circulate in these parts sooner than in others? I answer, that the portal is the only circle or set of vessels in the sanguiferous system, *originating and terminating* in capillary tubes, or inosculations with other vessels. They begin by the minutest threads from the stomach, spleen, pancreas, and intestines; enlarge as they approach the liver, where they diverge, and finally dwindle again into the same diminutive size with which they commenced. All other veins dilate as they approximate to the heart, affording more and more facility to the return of the blood, which is in most places assisted by the action of circumjacent muscles. The temporary quiescence or torpor, then, of the extreme branches of the vena portæ in the liver, from sympathy with the extreme vessels on the surface, [before alluded to] must completely check and arrest the reflux of blood from the whole of the viscera abovementioned. This state of things at once explains the tension, elevation, pain, weight, and anxiety about the præcordia. It shews why the biliary and pancreatic secretions are entirely suppressed for the time, while the gradual accumulation and temporary abstraction, as it were, of so great a proportion of the vital fluid from the circulation, will readily account for most, if not all the phenomena of the cold stage, many of which were before inexplicable.*

* It appe[illegible]s to me that this temporary arrest of so much blo[illegible] in th[illegible] liver and portal circle, (including the spleen) is

Theory of Fever.

But this accumulation of blood in the portal circle and viscera, must of necessity produce a corresponding plethora in the various branches of the cœliac and mesenteric arteries, leading to them; and since such large and important exits for the blood from the descending aorta, are, as it were, blocked up, a greater share of the circulating mass will be thus thrown through the carotids and vertebrals on the brain, occasioning or increasing the head-ache and congestion in that organ. This, and the congestion in the lungs, however, will be principally caused by the difficulty or inability of the heart to propel the blood from the ventricles as fast as it returns to the auricles, from the brain and lungs; hence the venous turgescence in both those organs, occasioning the head-ache, stupor, laborious respiration, and febrile anxiety, attendant on the collapse or cold stage.

The effects of sympathy are likewise to be taken into consideration. I have mentioned that which subsists between the extreme vessels on the surface, and those of the vena portæ;—the lungs too will sympathize with the skin,

one of the most admirable of Nature's expedients to obviate more dangerous effects. When the balance of the circulation is broken, and the blood is determined from the surface upon the internal parts, were it all to accumulate in the large vessels about the heart and in the lungs, immediate death would be the consequence; but the local abstraction of so large a portion of it from *actual circulation*, by its quiescence in the circle abovementioned, [where plethora is not so immediately detrimental] preserves the heart and lungs from being overpowered and suffocated, till reaction restores the equilibrium between the surface and the interior.

while the stomach and liver will sympathize with the brain, and vice versa.

This state of things, however, lasts not long; re-action at length takes place. Whether it be from the "stimulus of the blood itself,"—from that of "the retained secretions,"* from "accumulated irritability,"† from the vis medicatrix naturæ, or from all combined, we need not stop to inquire; but so it is, that the heart and arteries re-acquire vigour, and drive the blood to the surface, with great increase of heat, and a more rapid circulation of the vital fluid; all of which, nevertheless, does not appear to come into motion till the sweating stage. For this preternatural heat seems to have the same effect, for a time, as the previous coldness, in preventing perspiration externally, and secretion internally; since we find the load and uneasiness at the præcordia continue till the surface relaxes and a sweat breaks out, when a simultaneous relaxation in the extreme vessels of the vena portæ allows the blood to pass on freely to the heart, and the *biliary secretion to flow*, relieving the abdominal congestions. This last effect, so much accelerated by the cold affusion in the hot stage of fever, and so extremely beneficial, seems to have escaped the observation of Currie and Clutterbuck.

As the head-ache of the cold stage, from venous plethora, is continued in the hot, from arterial distension, [with a corresponding difference in sensation] so the nausea and sickness at stomach, arising apparently in the cold fit,

* Wilson. † Brown and Darwin.

from sympathy with the brain and liver—perhaps the skin, is continued in the hot, from the same causes; and the vomiting [in tropical climates particularly] afterwards greatly augmented, and rendered dangerous, by the deluge of vitiated bile poured into the duodenum, on the recommencement of secretion, occasioning the most distressing symptoms, and in many instances inflaming the coats of the stomach and intestines.

If, as some suppose, the cold be the cause of the succeeding hot stage, so the violence of the re-action, or rather over-action, of the sanguiferous system in the latter, must predispose to a repetition of the fits, from the subsequent atony produced thereby. If there be sensorial energy enough to enable the heart and arteries to clear the viscera and brain of the load of blood with which they were oppressed, and to set the secreting organs in action, then an *intermission* takes place; but if these circumstances be incomplete, a *remission* only. In what is called continued fever, it appears from the affection of the head, the load on the præcordia, the confined pulse, the dry, hot, and constricted skin, with a corresponding diminished biliary secretion and costive bowels, that the constitution is called upon for almost constant, or at least, frequently reiterated exertions, to relieve the internal congestions, and restore the secretions and excretions, marked by the diurnal remissions and exacerbations, till it either becomes habituated to the original cause, and restores the balance of the circulation, or sinks unequal to the task, frequently with the destruction, from inflammation, or suffocation, as it were, of an organ essential to life. Dissection having detected

the actual existence of such congestions and inflammations, I shall adduce a very few quotations from the most respectable authorities, in proof thereof.

Riverius makes use of these remarkable expressions respecting fevers.—"Rarissime fieri sine "interna, et peculiari visceris cujusdam affec-"tione, et plerumque inflammatione. Quare nun-"quam omittenda cura *hypochondriorum*, capitis, "thoracis, &c." [Praxis Medica.] Dr. Jackson, who had ample opportunities of examining the effects of fever at St. Domingo, observes, "When "the fever is rapid in its course, the spongy or-gans—the liver and lungs—are sometimes, as it "were, suffocated or oppressed: the lungs are "like a bag, filled with grumous blood; the liver "and spleen are filled with *black blood*, in such a "manner that their coverings are sometimes rup-"tured. In the *more protracted cases, the venous* "*system is turgid, as if filled with injection.*" Outlines of Fever, p. 208. "Perhaps," says Dr. Rush, "the stimulus of contagion determines the "fluids more violently, in most cases, to the liver, "stomach, and bowels, and thereby disposes them "more than other parts to inflammation. There "can be no doubt of the contagion acting *speci-*"*fically upon the liver*, and thereby altering the "qualities of the bile." On Yellow Fever, page 114. "In hot climates," says Dr. Moseley, "a "sound liver is never to be expected after death, "whether the disease has been acute or chronical." If these post-mortem facts be connected with the preceding reasoning, I think there will be little doubt left in the mind, that in all fevers, of tropical climates particularly, *congestion* takes place

in one or more of the organs alluded to; and that frequently inflammation and derangement of structure are the consequences.

If this be the case, then, we see the difficult task which Dr. Clutterbuck has imposed on himself, in assigning

"A local habitation and a name" *

to fever; since the seat of the injury will depend on *previous debility* of the organs in question, produced by climate, habits of life, and a variety of accidental circumstances.

Thus, in tropical climates, the hepatic system being weakened or deranged, *anterior* to the accession of fever, it is evident that it must suffer more considerably in each paroxysm, from the congestion during the cold fit, while the stomach and intestines suffer from the diseased secretions of the liver, in the violence of the re-action.

We thus see how bold venesection in the beginning, and active purging, have been so successful in relieving the congestion, and exciting the healthy secretions of the portal circle and liver, and how this relief is immediately extended to the head and lungs; while the cold affusion, moderating the excessive action, removing the irritation of morbid heat, cutting short the hot fit, by bringing on perspiration and biliary secretion, must be a most valuable remedy, inasmuch as it reduces the fever, as it were, from a continued to an *intermitting* form. It is in this state that bark, where no visceral derangement has yet taken place, by

* Dr. C.'s motto.

imparting a temporary tone to the stomach, and, by sympathy, to the brain and liver, will often prevent the recurrence of the paroxysm; but, from experience as well as theory, it must do harm during the cold, hot, or sweating stages; since the attempt to constringe *over-distended* fibres or vessels invariably increases the mischief.

But there is a medicine calculated, in itself, to fulfil all the principal indications abovementioned, in an eminent degree;—namely, while it proves a steady and permanent stimulus to the whole sanguiferous system, it powerfully promotes the biliary and other secretions, clears the intestinal canal of all offensive colluvies, removes the abdominal, and ultimately the other congestions alluded to, and keeps up a gentle diapnoe, or mild perspiration, on the surface of the body, during the period of its exhibition, and for some time afterwards. This medicine is MERCURY; and common observation proves, that it will produce any or all of these effects, when properly managed.

For instance, if given for a few hours, in conjunction with opium, at the commencement of fever, and after a copious venesection, it allays the irritability of the stomach, and relaxes the hepatic ducts, which seem at this time to be constricted, partly from sympathy with the extreme vessels of the portæ and on the surface, and partly from the irritation of diseased secretions. If it is then combined with a purgative, an immense alvine discharge is procured, relieving, in an admirable manner, the congestions of the liver, spleen, stomach, and the whole of the cœliac, mesenteric, and portal vessels, as well as those of the head. If it be then taken in sufficient doses, with opium

occasionally, to prevent its running off, till ptyalism is brought on, the effects before mentioned, viz. restored balance of the circulation, &c. will be produced, taking care, however, to substitute cathartics at proper times for the opium, in order that alvine evacuations may be kept free.

So much for theory. We now return to practical observations.

The difference between this and the yellow fever of the west has been always noticed, but, in my opinion, never adequately accounted for; and the investigation of this discordance is certainly interesting, since the same general causes, both remote and predisposing, are allowed to operate equally, or nearly so, in both hemispheres. First, then, let me observe, that the average space which a ship traverses, between Spithead and the Ganges, is 14,000 miles. Secondly, that in this voyage we run twice through the tropics; first from Cancer to Capricorn, and afterwards from Capricorn back to Cancer again; besides a great deal of oblique sailing in the vicinity of the southern tropic. During the period of time necessary for this performance, the human frame has the best possible means of accommodating itself to the change of climate: viz. a more steady range of temperature, and of a lower degree, than that of the ultimate destination; together with an atmosphere untainted by any noxious exhalation. In addition to these, the regular hours imposed on all classes, in ships proceeding eastward, the consequent habits of temperance acquired, and lastly, the paucity of luxuries which pretty generally attends a protracted voyage, especially the last weeks, sometimes months of it, all combine to

lower the tone of the constitution, and impart to it a considerable degree of assimilation, before the period of danger arrives. Thus the stomach and bowels will become somewhat accustomed to the increased secretion of bile, and even this last will be less profuse, as we are more inured to the high ranges of temperature, following the same laws, and sympathising with the perspiration.

Let us contrast this with a transatlantic voyage. The European, "full of flesh and blood," [to use a vulgar, but not inapplicable expression] embarks for the West Indies, in a transport or other vessel, where regularity and order are by no means conspicuous.* As he is under little control, and generally supplies a great proportion of his own fare, he endeavours to guard against any deficiency in that important point: in short, good English viands smoke daily on the festive board, while sufficient potation—"to keep the pores open," is steadily applied; till, after a few weeks run, he is launched at once into a tropical climate, and immediately landed, "with all his imperfections on his head." It is true that, when ashore, the facility of procuring the "*diffusible stimuli*" need not be much insisted on, since, unfortunately, the *arrack* of the east is equally easy of access to the men, as the *rum* of the west. But unquestionably the bad effects will be greater in the latter case, for the reasons adduced above.

With respect to officers, and other genteel classes of society, on landing in the western world, they are destitute of many powerful shields which

* I allude principally to troops.

are pretty generally interposed between Europeans of the East and the burning climate. In the former case, we may look in vain for the palankeen, the budgerow, the punka, the tatty, and the light, elegant, and cool vestments of India, together with the numerous retinue of domestics, anticipating every wish, and performing every office, that may save the exertion of their employers. The untravelled cynic may designate these luxuries by the contemptuous epithet of "Asiatic effeminacy;" but the medical philosopher will be disposed to regard them as rational enjoyments, or rather as salutary precautions, rendered necessary by the great difference between a temperate and torrid zone. Nor are these *dulcia vitæ* the exclusive property of the higher classes in India. The European soldier is permitted to inter-marry with the native Hindostannee nymph; and, whether married or not, he has generally a domiciliated *chere amie*, who cooks, washes, and performs every menial drudgery for *massa*, in health, besides becoming an invaluable nurse when he is overtaken by sickness.

Under the privation of these advantages, can we wonder at the effects, which exposure to all those causes, described as operating in Bengal, must produce on the full, plethoric habit of an Englishman, only four or five weeks from his native skies, before he debarks on the burning shores, or insalubrious swamps and vallies of our western colonies.

The more prominent distinctive features of the transatlantic fever, yellow skin and black vomit, [though by the bye they are frequently *absent* in this, and *present* in the eastern fever,] may

I think be attributed to the more violent action in the hepatic system, and superabundant secretion of *vitiated* bile, which, by the ceaseless vomiting, is thrown out in deluges on the duodenum and stomach, deranging their structure, while regurgitation into the blood suffuses the skin. "On the first and second days of the disorder," says Dr. Rush, "many patients puked "from half a pint to nearly a quart, of green or "yellow bile. Four cases came under my notice, "in which black bile was discharged on the *first* "day. Three of these cases recovered. I ascribed "their recovery to the bile not having yet acquired "acrimony enough *to inflame or corrode the sto-"mach.* There was frequently, on the fourth or "fifth day, a discharge of matter from the sto-"mach, like the grounds of coffee. I believed it "first to be a modification of *vitiated bile*, but I "was led afterwards to *suspect* that it was pro-"duced by a *morbid secretion in the liver,* and "effused from it into the stomach."——"That "the bile may become extremely acrid in this stage "of the disorder, is evident from several obser-"vations and experiments. Dr. Physick's hand "was *inflamed* in consequence of its being *wetted* "by bile in this state, in dissecting a body." p. 54. "I am not certain that the black mat-"ter which was discharged in the *last stage* of the "disorder was *always* vitiated or acrid bile. It "was probably, in *some cases*, the matter which "was formed in consequence of the mortification "of the stomach." p. 55.

In respect to the yellow colour, Dr. Rush is fully convinced that it is attributable to bile. "From these facts it is evident," says he, "that

"the yellowness, *in all cases*, was the effect of an "absorption and mixture of the bile with the "blood." p. 70.—Vide Hunter and Bancroft.

It is not meant to infer from hence, that the febrific miasms are exactly the same in the East and in the West: experience proves the contrary, as will be shewn in Section 4. (Vide Batavian Endemic.) I only mean to say, that the expression of their effects, on the biliary organs in particular, may be considerably modified by the circumstances above detailed. Neither do I suppose that in the last stages of black vomit, the matter ejected is bilious; but I am confident that the gastric derangement is in a great measure occasioned by the deluges of acrid, vitiated bile, poured from the liver on the stomach, during the vomiting in the early stages of the disease.* Hence, to check the gastric irritability early, is a most desirable object.

The stomachs of newly arrived Europeans in the West will, for the reasons detailed above, be much more liable also to take on inflammatory action. This, and the more violent orgasm in the hepatic system, appear to be the principal distinctive features in which the fevers of the two hemispheres differ; and are, I think, referible to the aforesaid causes.

---

* The above observations are confirmed by the dissections of Dr. Ramsay, at Bellevue Hospital, in 1803. (Vide Edinb. Med. and Surg. Jour. No. xxxii, page 423.) He traced, in numerous instances, the *black vomit* to the gall-bladder and hepatic ducts; and to this acrid discharge he attributes, in a great degree, the derangement in the stomach and bowels, which gives rise to the *bloody vomit* subsequently.

A practical point of much importance remains to be noticed; namely, whether or not the fevers in question are contagious.

It is lamentable to observe the discordance of medical opinions on a question that, at first sight, might seem so easily determined. Thus,

Clarke, Lind, Balfour, Chisholme, and Blane, are positive in the affirmative. While, on the other hand,—

Hunter, Jackson, Moseley, Miller, and Bancroft, are as decided in the negative!

Yet here, as in most other instances, truth lies between the extremes. As far as my own observations and judgment could guide me, I have been led to conclude, that the endemic fevers alluded to are *not* contagious, till a certain number of patients are confined together, under peculiar circumstances, when the effluvia *may* render them so. If, for instance, a man is seized with fever, from greater predisposition, or from greater exposure to the causes enumerated, than his companions, he will not communicate the disease to another, who may sleep even in the same chamber, where common cleanliness is observed. But on the other hand, if great numbers are attacked, nearly at the same time, and confined in the sick-berth of a ship, or ill ventilated apartments, in hammocks, cots, or filthy beds, it is possible that a contagious atmosphere may be formed, [without an attention to cleanliness and ventilation scarcely compatible, or at least hardly to be expected, in such situations,] which spreads a disease, *wearing the livery of the prevailing endemic*, but having a dangerous character superadded, namely, the power of reproducing itself in other subjects, both

independent of, and in conjunction with, the original endemial causes.* This circumstance reconciles the jarring evidences which have long kept the public opinion in suspense. It has been urged, that we ought to err on the safe side, by considering it contagious, and guarding accordingly by early separation. But this plan is not without its disadvantages, and, if I am not greatly mistaken, I have seen it produce what it was meant to prevent; viz. by confining all who had any symptoms of the fever in one place; where, as on board a ship in a tropical, or any climate, it is exceedingly difficult, if not impossible, to prevent the generation of an infectious atmosphere, and the impregnation of bed-clothes, &c. with the effluvia from the diseased secretions and excretions of the patients. On the other hand, I have seen both sides of the main deck nearly filled with fevers of the country, where screens and other means of separation could not be obtained, or rather, were not insisted on, and yet no bad effects followed; while under similar circumstances, where there were fewer sick, and all imaginable pains taken to insulate them, attendants have been seized, and other symptoms, indicative of contagion and virulence, have arisen, which, while they seemed fully to justify the precautions used, were probably owing to them alone. These hints may not be entirely unworthy of attention, inasmuch as they shew us how easily we may be deceived, and how positive we may be in our errors. They likewise shew that free ventilation and clean-

* Vide the two next sections.

lness may in general be confided in, between the tropics, where seclusion is inconvenient or impracticable; and that *separation of the sick from one another*, as far as possible, is a duty not less incumbent, than that of cutting off the communication between them and the healthy. There is this advantage attending the former, that alarm is in a great measure hushed, and the depressing passion of fear so far obviated.

Before taking leave of this fever, it will be necessary to say a few words respecting

INTERMITTENTS.

In those parts of India and China bordering on the Nothern tropic, when the Sun is in Capricorn, and the cool season sets in, viz. from the middle of November till the middle or latter end of February, fevers change from the remittent to the intermittent form. Thus at Bombay, Calcutta, and Canton, particularly the last-mentioned place, we have ample specimens during the above period, of agues and fluxes. From the Bocca tigris up to Canton, the river is flanked with extensive paddy grounds intersected and watered in all directions by the minor branches of the Taa and artificial canals. The surrounding country, however, is singularly mountainous; and at this season, has a dreary, wild, and bleak appearance. From these mountains the north-east monsoon comes down with a piercing coldness, which the Europeans, relaxed and debilitated by the previous heats, or their

sojourn on the sultry coasts of Hindostan, are quite unable to resist. As the improvident mariner has seldom any European clothing in reserve, adapted to this unexpected exigency, especially if he has been any time in India, we need not wonder that in such circumstances, a great number should be afflicted with intermittents and dysenteries at this season. For many weeks, we had seldom fewer than thirty or forty, often more, at one time, laid up with these complaints: they were generally tertians with a few quartians. The apyrexia was tolerably clear, and the bark exhibited in the usual way recommended for similar fevers in Europe, was a certain and expeditious cure, where no visceral obstructions existed. In the latter case, which was but too frequent, mercury, of course, was an essential auxiliary. It is proper to remark that in two ships of war lying at the bocca tigris, [The Grampus and Caroline] the bark was entirely expended on the great number of intermittents. In this dilemma we had no other resource than mercury; and this medicine invariably stopt the paroxysms as soon as the system was saturated; but it must not be concealed, that three-fourths of our patients, treated on this plan, relapsed as soon as the effects of the mercury had worn off, and this after three, and in a few instances, four successive administrations, so as to excite ptyalism. I attributed these failures to the coldness and rawness of the air, together with the want of proper clothing and defence against this sudden transition from a hot to a comparatively cold climate; very unfavourable circumstances in the mercurial treatment. No ill effects, however, resulted.

In the month of October the weather was so warm, and the nights so cloudless and serene, with very little dew, that many of us slept in the open air at Lintin, an island about twenty-five miles above Macao, where we had tents ashore for the sick and convalescents, as well as the different working parties.

But in November the nights became exceedingly cold; and although there was hardly any thing that could be called a swamp or marsh on the island, yet intermittents and fluxes made their appearance, and continued to increase during our stay, without any very apparent cause, except this sudden vicissitude in the temperature of the air.

There was indeed a very high peak in the centre of the island, the sides of which were covered with thick grass-jungle, and over this the winds blew towards the ship and tents. There can be no doubt that hills and mountains arrest the course of marsh miasmata through the air, and when a sufficient quantum of these is collected, they will produce their effects on the human frame, in a similar manner, as if issuing from their original source; especially when the predisposing causes are in great force. Hence we see how miasmal fevers may take place on the summit of *Morne fortune*, or the rock of *Gibraltar*, without any necessity for the supposition that the febrific exhalation arose from those places themselves.

We next moved up to the Boca tigris, and got into the vicinity of extensive marshy and paddy grounds, which contributed greatly to the augmentation of the sick list.

It is somewhat curious, that a frigate [the

Dedaigneuse] belonging to the squadron, which lay in the typa, near the city of Macao, remained perfectly healthy, while we were so afflicted with the diseases abovementioned. As the crew of this ship was exposed to all the causes, *predisposing and exciting*, which could exist farther up the river, it follows, that marsh exhalation must have been here, as elsewhere, the fundamental *remote cause*, that gave origin to the intermittents. At Wampoa, sickness was still more predominant among the Indiamen, than at the Bogue—not so much from any great difference in the medical topography of the two places, as from the vicinity of the former to Canton, to which city parties of the last-mentioned ships' crews were in the habit of repairing on leave, to the no small detriment of their health, from the course of intemperance pretty generally pursued. The great intercourse, likewise, between Wampoa and Canton afforded infinite facility to the introduction of inebriating materials among those who remained on board. The liquor retailed to seamen in China is certainly of a very destructive nature. Its effects have attracted so much attention, that when His Majesty's ships are leaving the coasts of India for China, there is generally an order received from the admiral, enjoining the officers to guard as much as possible against the introduction of "SAMSOO" among the crews, which, says the order, "is found to be poison to the human frame."—It were a consummation devoutly to be wished, could this injunction be extended to the arrac of India, from which the samsoo only differs in being more impregnated with certain stimulating materials, prejudicial to the stomach and bowels.

The ordinary mode of preparing Samsoo is as follows:—

"The rice is kept in hot water till the grains are swollen; it is then mixed up with water, in which has been dissolved a preparation called '*Pe-ka*,' consisting of rice-flour, liquorice-root, anniseed, and garlic. This hastens fermentation, and imparts to the liquor a peculiar flavour." It is probable, however, that other more active ingredients are added to that in use among the lower classes at Canton. Bontius, speaking of the dysentery at Batavia, alleges, as "the principal cause of this disease, the drinking an inflammatory liquor called *arrac*, which the *Chinese* make of rice, and the *holothuria*, or what is called quabbin in Holland. These holothuria have so *pungent* a heat, that the touch of them *ulcerates* the skin and raises vesicles." p. 16. He adds a pathetic remark. "Happy were it for our sailors, that they drank more moderately of this liquor; the plains of India would not then be protuberant with the innumerable graves of the dead!"

The same remark might be with strict propriety applied to the arrac of India in general, where, as at Bombay for instance, its pernicious effects are equally conspicuous as at Batavia.

It may at first sight appear singular, that mountainous countries covered with lofty woods, or thick jungles, should give rise to fevers, similar in every respect to those of flat and marshy districts. But the reason is obvious, when we consider that in the first-mentioned situations the surface of the earth is constantly strewed, particularly in autumn, with vegeto-

animal remains, and kept in a moist state by the rains, or drippings of dews from the superincumbent foliage. The stratum of atmosphere, therefore, in contact with the ground, becomes highly impregnated with effluvia, which are seldom agitated by breezes, or rarefied by the rays of the sun; either of which would tend to dissipate the exhalations.

Thus, among the lofty forests and impenetrable jungles of Ceylon, the most powerful miasmata are engendered, producing fevers of great violence and danger. "It is under the "branches of these shrubs," [in Ceylon] says Lord Valentia, "that the fatal jungle fever is "probably generated. Not a breath of air can "pass through; and the confined exhalations "from the black vegetable mud, loaded with "putrid effluvia of all kinds, must acquire a "highly deleterious quality, affecting both the "air and the water." Travels, vol. 2.

Generally speaking, however, these hill, or jungle fevers, as they are locally designated, appear in the form of intermittents, especially among the natives, and those Europeans whose constitutions are assimilated to the climate. Unfortunately, among the latter class these fevers either soon produce, or are accompanied by, visceral obstructions, too frequently terminating in confirmed hepatitis; hence the necessity of checking them as soon as possible, and of using all imaginable precaution in guarding against the remote and predisposing causes. The treatment, of course, must vary, from a simple administration of bark, to its combination with mercury, or the exhibition of the latter

alone, so as to keep up a gentle ptyalism for some considerable time. In these elevated situations, far from seas, or even rivers, and entirely out of the reach of tides, the influence of the moon is unequivocally evinced.

"It is by no means uncommon," says Captain Williamson, "to see persons, especially "Europeans, who have to appearance been "cured of jungle or hill fevers, as they are "called, and which correspond exactly with our "marsh fever, laid up at either the full or "change of the moon, or possibly at both, for "years after." This from a non-professional gentleman, is another proof of the sandy foundation on which Dr. Lind's hypothesis, before alluded to, rests; and of the truth of Dr. Balfour's observations.

66

BILIOUS FEVER.

Sec. II. This is the grand endemic, or rather epidemic (morbus regionalis) of hot climates; and although greatly allied in many of its symptoms, perhaps generally combined, with the Marsh Remittent, already described, yet occurs in various places, both at sea and on shore, where paludal effluvia cannot be suspected.

Notwithstanding that this fever is hardly ever mistaken, by the least experienced practitioner, yet so extremely diversified are its features, by peculiarity of constitution, climate, season, and modes of life, that it is very difficult to give even a general outline of it, without involving apparent contradictions.

There are always, however, some prominent symptoms which sufficiently characterise Bilious Fever, for every practical purpose, which is the chief object in view.

These are, gastric irritability—affection of the præcordia,*—and affection of the head. Rarely will all, or any of these be absent. The other items in the febrile train are by no means constant and regular. Thus the pulse is frequently

* In the term præcordia I always include those viscera and parts immediately below the diaphragm;—the liver, stomach, and spleen, for instance, in the sense of Fernelius, lib. iv, De Febribus.

regular, and sometimes up to 120 or 130 in the minute. It is the same with the temperature of the skin. Often, when mad delirium is present, the pulse will be 86, and the thermometer in the axilla at 96° of Fahrenheit. The bowels are almost always constipated, or in a state of dysenteric irritation. No such thing as natural stools in this fever are ever to be seen, unless procured by art. Frequently, but not always, yellowness of the eyes, and even of the skin, takes place; and the mental functions are very generally affected, which indeed is characteristic of all bilious diseases. This fever is not near so dangerous as the more concentrated marsh endemics, such as those of Bengal, Batavia, &c. &c. Indeed I have long thought that these last are the bilious remittents of the country, modified and greatly aggravated by the peculiar nature of the local miasmata. However, that they occasionally exist independently of each other, I have likewise no doubt; for we must not let the rage for generalising blind us to facts.*

With respect to the treatment, I have never

* My meaning is this; that the fever in question frequently arises from atmospheric heat, or rather atmospheric vicissitudes, deranging the functions of important organs; and that it is, as Dr. M'Gregor supposes, symptomatic of local affection. Where marsh miasma is added, which is generally the case, then we have the endemic of the place, modified by the peculiar nature of the effluvia, and from which we are not secured but by local habituation to the cause. Residence, therefore, on the banks of the Ganges, is no protection from the miasma of St. Domingo, or Batavia, as will be proved in the 4th section.

found it difficult, when the means which I have minutely detailed under the head of Bengal endemic, were early and steadily applied. Bleeding, I know, is seldom employed; but I can state that three other surgeons on the station, besides myself, had recourse to venesection in the fevers of India, with the greatest benefit. These were, Mr. Dalziel, late of the Naval Hospital at Madras; Mr. Cunningham of the Sceptre; and Mr. Neill, formerly of the Victor, latterly of the Sceptre. This is a small band opposed to the host of anti-phlebotomists; but it must be remembered, that the evidence in favour of bleeding is, from its very nature, more conclusive than that which is against it. In the first place, a great proportion of practitioners will be deterred from the use of the lancet entirely, by the current of prejudice. In the second place, a great many of those who do venture on it, will be easily discouraged by any reverse at the beginning, which is sure to be attributed to the heterodox remedy; a striking instance of which will be given hereafter, in the section on "Endemic of Batavia." But on the other hand, those who persevere must be more than mad, if they continue a practice which is not beneficial; and if it is, how must their proofs accumulate! and how solid and experimental must be their nature, compared with those on the opposite side of the question, where prejudice and timidity are so apt to mislead!

I have to remark, however, that if the *other means* which I have recommended be steadily and judiciously applied, the neglect of the lancet

may not, in general, be attended here with much risk; though of this I have my doubts. For if life be preserved without venesection, are we sure that the *sequelæ* are not more numerous in such cases? Finally, my opinion is this:—that when we wish to arrest the progress of bilious fever, "*cito, tute, et jucunde,*" we should in all cases, where the constitution is not broken down by climate, and particularly where determinations to the brain or liver are conspicuous, as they too often are, take one copious bleeding at the beginning, (the repetition must be guided by the judgment of the practitioner,) which will very effectually promote the operation of all the succeeding remedial measures, and obviate in a great degree those visceral obstructions and derangements, which this fever so frequently entails on the patient.

The following condensed, but clear account of this fever, as it exhibited itself, in all its shapes and bearings, and with no small degree of violence, on the great mass of a ship's company, will convey a better idea of the disease, and in a more practical way, than any general description, however laboured, or however minute.

I have only to premise, that the symptoms were carefully noted, and the practice detailed on the spot, by a gentleman of no mean talent for observation; and although I differ from him on the *exhibition* of emetics, and the *omission* of venesection, it is with regret, as I entertain the highest respect for his abilities and candour. It will be seen that, in most other points, his prac-

tice is nearly similar to what I found most successful in the Endemic of Bengal.

"On the 2d March, 1804, His Majesty's ship Centurion dropped anchor in Bombay Harbour, on her return from Surat; at which time the ship's company were in good health. During the next week, the weather was variable—hot and sultry, in general, through the day, alternated with cold damp chills at night, when the dews were heavy, and the land winds keen from the adjacent mountainous coast.

On the 9th of the same month, several men complained of slight indisposition, which we did not consider of any importance, little aware of the distressing scene to which this was an immediate prelude.

Centurion, Bombay Harbour,
March 10*th*, 1804.

Eighteen men complained to me this morning, of having been taken suddenly ill in the night. Their general symptoms were—severe pain in the head, arms, loins, and lower extremities; stricture across the breast, with great pain under the scrobiculus cordis; retching and griping. In some the pulse intermitted, and the temperature of the skin was increased; others had cold chills, with partial clammy sweats; but all complained of pain under the frontal bone; many of them with white furred tongues, and thirst. A solution of salts and emetic tartar, designed to operate both ways,

was prescribed, with plenty of warm diluent drinks. P. M. The solution operated well, both upwards and downwards, in all the patients. Many complain now of pain in the epigastric region and head, with burning hot skins. Gave them Pulv. Antim. grs. vj, Tinct. Opii, gt. xx, Aq. Menth. ℥ij; hora somni sumend. with warm rice water, slightly acidulated, for drink during the night. The patients to be secured from the land-winds, which at this season of the year are considered very pernicious. Almost all these men had been exposed to the intense heat of the sun by day, and to the influence of the night air, while lying about the decks in their watches. Mr. Brown, the carpenter, was on shore in the heat of the sun to-day, and attacked this afternoon with the fever.

Bombay Harbour,
March 11th, 1804.

Nine patients added to the list this day. The bilious fever set in with nearly the same symptoms as yesterday, and the same mode of treatment was pursued.

Many of yesterday's patients are very poorly this morning; complaining of severe pain in the head, limbs, loins, and across the epigastric region; with constant vomiting of viscid bile. Prescribed from five to ten grains of calomel, with small doses of antimonial powder, and tincture of opium, to be taken three or four times a day.

There is little intermission of pulse to-day. In some the skin is cold; in others hot, with

insatiable thirst. Tongue, in most cases, covered with a thick white crust. Great irritability of the stomach, and aversion to food. Bowels rather constipated—some have a fœtid bilious purging. P. M. The calomel appears to allay the irritability of the stomach; while the antimonial powder and tincture of opium keep up a warm moisture on the skin,

Bombay, 12th March.

Ten added to the list this morning, with bilious fever. The symptoms and treatment nearly as before. Some of the patients of the 10th are better to-day, the irritability of the stomach being a good deal allayed by the calomel and opium; but they still complain of pain in the head and limbs, with great debility. Eyes heavy, and tinged yellow—pulse full—bowels constipated. Prescribed a dose of Natron Vitriolat. after the operation of which, the calomel, &c. to be continued as before.

The emetic-cathartic solution operated well with the nine patients of yesterday (11th); most of them are very ill this morning. They have incessant vomiting of green thick bile, with pain in the epigastric region and head—thirst insatiable. Prescribed the calomel, opium, and antimonial powder, as in the other cases. No delirium has yet appeared in any of the patients; nor much alteration from health in the pulse. In many, the temperature of the skin very little, if at all increased; constipation of the bowels nearly a general symptom.

The decks are now crowded with sickness.

Bombay, 13th March.

Eight added to the list this morning, with the prevalent bilious fever. Scarce any heat of skin, or acceleration of pulse. *All appear to labour under some hepatic affection, which seems to be immediately communicated to the brain, causing great pain under the frontal bone.** Vomiting, I think, relieves them a good deal. The quantity of bile they discharge is enormous, and of a depraved or highly vitiated quality.

Most patients of the 10th and 11th appear very ill; complaining of pain across the epigastric region, and in the head, with frequent vomiting of bile; tongues swelled and furred—no great heat or acceleration of pulse. The constipation of bowels I relieve by doses of natron vitriol. or calomel and jallap. The calomel, &c. taken from fifteen to thirty grains a day, according to the urgency of the symptoms. No appearance yet of

* It was from observing this symptom, that I was first led to form the theory of fever, sketched out in the last section—namely, that independent of the sympathy existing between the brain and liver, the congestion, or as it were, stagnation of blood in the portal circle, causes a greater determination to the brain, whereby that important organ becomes oppressed, and keeps up the train of febrile symptoms. If this cerebral congestion is relieved by bleeding, or any other means, immediate energy is communicated to the heart and arteries—reaction and biliary secretion follow, and the balance of the circulation is once more restored. Vomiting, as determining to the surface, will produce this effect; but the gastric irritability is dangerous. Lastly, mercury, as keeping up a steady action in the extreme vessels of the vena portarum, prevents the balance of the circulation being again destroyed.

ptyalism in any of the patients. The thermometer placed in the axilla of several, did not shew more than $96\frac{1}{2}^{\circ}$ or 97°—the pulse not exceeding 88 in the minute.

Many of yesterday's patients (12th) are also very ill. All appear to labour under some morbid affection or secretion of the liver. Two of them much troubled with cough, and spasms in the muscles about the neck, impeding deglutition and respiration. Blisters, with vitriolic æther and tinct. opii, relieved this symptom. The warm bath had no good effect. Pulse nearly natural.

Bombay, 14th March.

Nine added to the list this morning, with the prevalent bilious fever. Two of them were suddenly seized with violent mad delirium, and made a dart to get overboard, but were providentially secured in time. No heat of skin, or acceleration of pulse; but all complain of pain in the head and epigastric region, which emetics and blisters frequently relieve.

Those patients who were first attacked (10th) are very ill; many of them highly tinged yellow; their eyes swelled, and the blood vessels a good deal distended. Pain in the head still continues severe. At night many of them are delirious. The mercurial treatment continued. I tried the bark, with nitrous acid, in several cases to-day; but it did much harm, greatly increasing the irritability of the stomach. The fever seems inclined to run through the whole of the ship's company,

The patients of yesterday (13th) are very ill. The calomel in general sits easy on the stomach, and appears to check the vomiting a good deal. I find doses of the natron vitriol, and emetic tartar cleanse the stomach and bowels better than calomel and jallap.

Bombay, 15th March.

Five men attacked last night; one with violent phrensy, who was in good health a few minutes before. He was all at once seized with mad delirium, and made a dart to get overboard, but was caught. Scarce any increased temperature of the skin, or acceleration of the pulse. The delirium was removed by an emetic. P. M. A few have their mouths slightly affected, and are much better, but still complain of pain in the head and right hypochondrium. Our decks are now crowded with sick, and the effluvia intolerable. The ship is daily fumigated. Sent twenty of the worst cases to Bombay Hospital, many of them very ill, and changing yellow.

Bombay, 16th March.

Five men were suddenly seized during the night with violent mad delirium—great oppression at the epigastrium—abdomen distended—perfect loss of memory, and all recollection of their messmates and others around them, mistaking one person for another.—Great desire to destroy their own lives, and the lives of those who held them down.—The pupils of the eyes a good deal dilated,

and not inclined to contract when exposed to a strong light.* All of these evinced a great desire for lime-juice, which I gave them, and which they frequently mistook for porter. But at times it was difficult to make them swallow any thing, as they would crash the vessel in which it was offered between their teeth. When full vomiting was excited, it generally relieved them, by bringing away immense quantities of viscid or vitiated bile.† They all complained, at intervals, of pain in the head and epigastric region, but particularly in the right hypochondrium. I bled in one case, tried the cold affusion in another, and the warm bath with purgative enemas in a third, without success.‡

---

* The cerebral and abdominal plethora is here so strongly painted, that I should have considered myself authorised to bleed usque ad deliquium, or the relief of the symptoms.

† The action of vomiting, by increasing biliary secretion and determining to the surface, explains the relief above-mentioned. But there is a great drawback from its utility, in the gastric irritability that too often remains. The dread of increasing the cerebral plethora or congestion, by vomiting, is more imaginary than real; the good effects arising from it, in the manner here alluded to, far counterbalancing any momentary augmentation of the plethora. (Vide article "*Apoplexy*," in Dr. Parr's London Medical Dictionary.) The stomach itself is the organ which suffers most by this otherwise salutary operation.

‡ The quantity of blood abstracted is not mentioned; but it is perfectly immaterial; for unless venesection be carried *usque ad deliquium or the relief of the symptoms*, no possible good can accrue, but even harm. This is a practical fact, well known to those who have tried this remedy in the east. It may be accounted for thus: the portal congestion, from its peculiar position (in a circle of vessels, whose circumference is entirely composed of capillaries) places a great portion of the

Our decks now being crowded with sick, sent twenty-one men to Bombay Hospital, viz.

11 of those attacked on the 10th and 11th instant; several of them changing yellow, and all of them labouring under hepatic affection, with great pain under the frontal bone.
5 of those attacked on the 12th; not quite so bad as those who were first seized.
5 of those taken ill 13th and 14th.—Symptoms nearly the same.

Tot. 21 in number.

The remaining patients on board are very ill. All complain of pain in the head and liver, with a diseased secretion of bile, and constipated state of the bowels--swelled, furred tongues—restless-

vital fluid at rest, and determines the remainder more particularly to the brain, by which this organ becomes oppressed. Now if venesection be not carried the length of relieving the cerebral congestion, and so letting loose the energy of the brain on the system at large, it is quite clear that we diminish the strength without gaining our object, and consequently retrograde from the proper path. Indeed, we may justly say of venesection, what the poet says of learning—

A little bleeding is a dangerous thing;
Bleed free—or open not the vital spring.

This is not meant to censure the surgeon whose practice is detailed. Considering the general prejudice against bleeding in India at that time, it would have required no small degree of fortitude to employ so heterodox a remedy under the immediate eye of the presidency, where even success would hardly have supported the innovation.

ness and exacerbation at night, with slight heat of skin, thirst, and trifling acceleration of pulse—frequent giddiness and stupor, without the least relish for food. I continue to evacuate the bowels with natron vitriol. or calomel and jallap, and persevere in the mercurial treatment till ptyalism takes place.

Bombay, 17th March.

Eight men attacked with fever during the last twenty-four hours: four of them with violent mad delirium; the others complained of pain in the head, loins, lower extremities, and epigastric region, with swelled, tremulous tongues; but no great heat of skin, or quickness of pulse. Some were slightly indisposed for a day or so before; others had no premonitory sensations whatever. They were all well evacuated with the emetic-cathartic solution, or calomel and jalap: I prefer the former, as it acts both ways at once.

Several on board are very ill, without the least appearance of ptyalism; others have their mouths affected, and the bad symptoms disappearing. In the former, I can perceive little or no alteration in the temperature or pulse from a state of health.*

Sent 17 to the hospital to-day; many of them changing yellow, with *pain and fulness about the liver, and severe head-ache.*

* Is there not great torpor throughout the system here, from the state of the brain?

Bombay, 18th March.

Six admitted this morning: three with violent mad delirium, which lasted several hours; in the others, the symptoms were milder. All our nurses are now dropping ill, and the fever seems to acquire a contagious character, as it is running through the whole of the ship's company.* One of the wardroom officers was attacked last night. We now send them on shore nearly as they are taken ill.—*All labour under some affection of the liver, which is immediately communicated to the brain.*

At noon, sent 15 of the worst cases to the hospital; several of them changing yellow. They are generally attacked first in the night, and always experience an exacerbation afterwards, as the evening closes in. No remissions on alternate days; the only amelioration is in the mornings.†

I this day visited all our patients at the hospital. Several of them are very ill—many quite yellow; and all have great pain and fulness in the region of the liver, with constipated bowels. They are treated nearly in the same manner as on board;

* Although it does not follow that the disease is contagious, because the nurses are taken ill; yet it appears very probable that this fever *became* contagious *from accumulation.*

† Miasmal fevers, when not very concentrated, often shew remissions on alternate days; till at length, as the season changes, they slide into intermittents.

When they are so virulent, however, as to occasion great and sudden derangement, whether of function or structure in important organs, it is needless to say, that such remissions cannot be looked for. Vide sections 4 & 5.

the medical gentlemen there placing their whole confidence in a continuance of the mercury. They attach much importance, however, to frictions with ung. hyd. fort. over the region of the liver; giving three grains of calomel four or five times a day, in conjunction with small doses of antimonial powder and opium, as occasion requires. Two patients at the hospital are delirious at night.

Bombay, 19th March.

Twelve taken ill with fever since yesterday; most of them attacked during the night. In eight cases it set in with violent mad delirium. Several of them were in perfect health a few minutes before; others had some slight previous indisposition.

Six cases on board have now shewn symptoms of ptyalism, and are greatly relieved in all respects, with some return of appetite. As the spitting increases, the yellowness of the skin disappears proportionally. Prescribed the nitrous acid both to the convalescents, and those now under the mercurial course; a practice much recommended by Mr. George Kier, surgeon of this presidency.

Bombay, 20th March.

Five people attacked since yesterday; two, without a moment's notice, were seized with violent mad delirium.* The other three with symp-

* The nature and violence of the attack shew that it could not proceed from *latent* miasmata received previously at

toms more moderate; but all with pain in the head and epigastric region. They were treated as already detailed. Sent 18 of the worst cases to the hospital; all labouring under hepatic affection, and many of them very ill. A few more have their mouths affected since yesterday, and are getting better.

Bombay, 21st March.

Ten cases of fever within the last 24 hours. Four of these were men who came on board from the Elphinstone East-Indiaman a few days ago, and were attacked with violent phrensy, and convulsive exertions, craving for drink of various kinds. After the spasms were allayed, they complained of pain in the epigastric region and head —tongues swelled—pain in the liver—vomiting of acrid bile *—stricture across the forehead and sinciput—pulse natural. After vomiting, they found themselves much relieved. Prescribed calomel, opium, and antimonial powder, as already

Surat. Neither could the fever arise *entirely* from land-wind effluvia here, since the other vessels lying in harbour were not affected. Some people may suspect a local cause in the ship's hold, or elsewhere, but no such source is traced by the gentlemen composing the survey. The constitutions of the crew, coming in from the more equable temperature of the sea, were strongly affected by the abrupt atmospherical vicissitudes at Bombay; and the effects resulting thence were aggravated by the miasmal impregnation of the land-wind by night.

* Did this violent mad delirium arise from the brain sympathizing with the liver or stomach, where acrid bile might have been accumulated? or did it arise from exhalations conveyed by the land-winds, and acting on the brain? I am inclined to think that it was owing to both.—Contagion?

detailed. At 10 o'clock this morning Lieut. P. was attacked with delirium—pain in his head and epigastric region—tongue swelled, and white—muttering between his teeth—no heat of skin. He assisted last night in holding several men who had mad delirium, and probably inhaled the effluvia from their breath or bodies. Two patients, who were convalescing since the nineteenth, and taking nitrous acid, seem inclined to relapse as the soreness leaves their mouths;—mercury again prescribed.

Bombay, 22d March.

Five added since yesterday, with the prevailing fever. All complain of pain in the head and right hypochondrium—eyes and tongue swelled;* the latter covered with a bilious crust—small, hot, bilious evacuations by stool, with great thirst. *They cannot bear the slightest pressure on the region of the liver*

I have applied for a medical survey on the state of the ship, to inquire whether or not the fever is contagious, and what is the best plan of arresting its progress.

Bombay, 23d March.

A young man in perfect health, who has been ten years in India, while assisting his sick messmate into the hospital boat to-day, was all at once

* This symptom is noticed by Mr. Tainsh on the coast of Syria, (Medical and Physical Journal) and by the Gentleman at Bussorah, who narrates his own case. Transactions of a Society, &c. &c.

attacked with the fever. Severe pain in the head, epigastrium, and liver, was soon followed by the most violent mad delirium, and incoherent language; he fancying the people around him were going to murder him. No heat of skin or acceleration of pulse. This state lasted four hours, and was relieved by a vomiting of fœtid, green, acrid bile.

The fever not so prevalent now, and seems to have spent its force, as only one man was seized in the last twenty-four hours. The nights are becoming warmer, which I hope will soon check its progress.

Bombay, 24th March.

Five men attacked since yesterday; one with the usual mad delirium. All labour under pain in the head, epigastrium, and liver; with white, swelled tongues; pulse and temperature little increased. Prescribed gentle emetics of pulv. ipecacuan. with plenty of warm diluent drinks, on their first complaining.* After the operation, calomel, opium, and antimonial powder four times a day, with pediluvium.

Pursuant to my request, a medical survey was

* Some change in the administration of emetics is here evident, though no reason is assigned. I think the plan I have recommended, of allaying the gastric irritability by calomel, or calomel and opium, and then procuring copious intestinal evacuations, will be found the safest practice; as it effectually emulges the liver and its ducts, and prevents or lessens the abdominal and cerebral congestions; especially when aided by early venesection.

Bilious Fever.

held on board to-day, by the following gentlemen, viz.

Dr. Moir, of the Medical Board;
Dr. Scott, ditto ditto;
Dr. Sandwith, of the General Hospital; and myself.

After an investigation and mature deliberation, it was agreed that the following would be the most effectual means of checking this fever, *which appears to be contagious.**—

* "It has never been known," says Dr. Bancroft, "as I "am informed, that a single case of this fever (typhus) had "occurred on either side of the Indian peninsula." Essay on Yellow Fever, page 510. If this be the case, and if the respectable gentlemen abovementioned, who had the best means of ascertainment *on the spot*, did not give an erroneous judgment, it follows, that *other fevers* may, under certain circumstances, *become* contagious. I am at a loss to conceive how Dr. Bancroft will extricate himself out of this difficulty, unless he sets about proving that those distinguished gentlemen were entirely *wrong* in their decision. That this fever had a single symptom of typhus, Dr. B. will not, I am sure, allow; and it will require some ingenuity to invalidate, in the minds of others, the testimony of its contagious nature above adduced. In the next section, an instance still more in point will be shewn, on the Coromandel side of the Peninsula. I may here observe, that Dr. Bancroft quotes Dr. Wade, to prove that marsh fevers in the East Indies are never contagious; but he takes no notice of the opposite opinion of Dr. Balfour, who had equal experience, and delivered his sentiments from the head of the Medical Board at Calcutta. Let us support our hypotheses by balancing testimonies, rather than suppressing such as run counter to our views. I may add, that Dr. B. is *unnecessarily* severe on Dr. Wilson, and that many of those important *flaws*, which he thinks he has discovered in Dr. W.'s statement, and on which he lays great stress, appear perfectly futile to those who are conversant with nautical

" 1st. To land all the sick at the General Hospital.

" 2d. To remove the ship to Butcher's Island, and there disembark the remainder of the ship's crew, with their bedding, &c. &c.

" 3d. To clean, whitewash, and paint the ship throughout; to fumigate her, and likewise the people's bedding, with nitrous gas; and to fire off all the lower deck guns."

Bombay, 25th March.

Nine cases of fever in the last twenty-four hours. Three, who were in perfect health a few minutes before, were seized at once with mad delirium. Several of those patients, whose fevers were checked at the commencement of ptyalism, and where I trusted the remainder of their cure to nitrous acid, are now relapsing, their mouths being quite well.*

affairs in His Majesty's service, notwithstanding the sage opinion of the Navy Office clerk.

* I have expressly remarked, in the last section, that *free and copious* ptyalism is necessary. Where this is brought on in a few days, and especially where bleeding or other evacuations have been early premised, there has seldom so much derangement taken place in the liver, or even its functions, as to require the continuance of mercury. But where no VS. was employed, and the disease has gone on many days before ptyalism, as above, the action of mercury must be kept up for some time after the fever is checked, till the functions of the liver are completely restored.

I cannot say much in favour of the acid, though so highly recommended by Dr. Scott and Dr. Kier of this presidency, who give it in all cases during and subsequent to the mercurial course. Those attacked yesterday were gently vomited with ipecac. and warm diluent drinks; after which they took small doses of calomel, opium, and pulv. ant. four times a day, with tepid bathing; a practice much recommended by Dr. Moir of this presidency. Sent eight cases to the hospital—sixteen on board.

Butcher's Island, 26th March.

Pursuant to the decision of the Medical Survey, we this day landed on Butcher's Island our sick, sixteen in number, in various stages of the fever; some with their mouths getting sore, and the bad symptoms disappearing—some in a state of ptyalism and convalescence—and others with all the usual symptoms of the fever, particularly the hepatic affection, head-ache, and yellowness of the eyes and skin.

Butcher's Island, 27th March.

No addition to the list since landing. All those whose mouths are affected have no other complaint than debility. The sick are comfortably situated in the castle, which is well aired and clean.

B. Island, 28th March.

Several patients now convalescent, with sore mouths. One patient very restless last night, with

great heat of skin, and pain in the region of the liver, which was relieved by a blister, and calomel bolus, with opium and antimony. Most of the others have hepatic affections, which subside as the system becomes impregnated with mercury.

B. Island, 29th March.

All in progress to recovery; their mouths getting sore.

B. Island, 30th March.

Two men, who were yesterday employed in cleaning the ship, have been seized with fever; but the symptoms are milder than in those formerly attacked on board. Same treatment.

B. Island, 31st March.

Only twelve on the list. Most of them convalescents, with sore mouths.

B. Island, 4th April.

The patients at Bombay Hospital recover very slowly. Almost all of them labour under affection of the liver, with severe headache, debility, and want of appetite. They have sent us over 30 cases, for change of air. Two more were attacked yesterday with fever and dysentery; they had been employed in cleaning the ship. After evacuations, the calomel as in the others.

77

B. Island, 5th April.

Of the 30 patients received from Bombay Hospital, none are worse. They find themselves cooler and more comfortable here. Several have considerable affection of the liver, attended with night fever, which is sometimes ushered in with rigors and cold chills, succeeded by hot skin, thirst, and head-ache. Prescribed five grains of calomel, one of opium, and two of antimonial powder, thrice a day; blisters to the part affected. All my original patients are better, with sore mouths and debility. *I tried the decoction of bark in several cases, but find they recover faster without it.* I also tried the nitrous acid, but cannot say much in its favour. The two patients with dysenteric symptoms have pain in the region of the liver.—The same treatment as the others.

B. Island, 6th April.

The patients from Bombay Hospital recover surprisingly fast. Three of them were highly tinged yellow, which goes off as their mouths become sore. Many have constipated bowels: decoction of tamarinds, with natron vitr. an excellent laxative. A few of the convalescents, as they get stronger, have a return of pain in the liver, for which the calomel is again prescribed.

The dysenteric patients are relieved by the calomel and opium—the tenesmus not near so violent. Mercury continued.

B. Island, 7th April.

The patients from the hospital daily gain strength and appetite; *more particularly those whose mouths are well affected with mercury.*

All the fevers experience a nocturnal exacerbation; in some ushered in with rigors.

In Bombay Hospital this fever runs great lengths. Several patients are quite yellow, with debility—severe pain across the epigastrium, in the head, and in the loins. No great acceleration of pulse; but all are much worse at night than during the day. Calomel, opium, and antimonial powder, internally, with frictions of the ung. hyd. and frequent purgatives, are the means employed by the physicians of the hospital. They also tried the bark and nitrous acid, with the worst success: it generally occasioned great sickness at stomach, stricture on the surface, and obstructed perspiration, with universal inquietude. Removed 32 cases more of fever to Butcher's Island from the hospital.

B. Island, 10th April.

The bilious fever not near so prevalent now, as when we were on board; and in all attacks the symptoms are milder.

The patients from the hospital promise fair; some have dysenteric complaints, which go off as the mouth becomes sorer. Two fresh attacks, with much pain in the region of the liver, and bilious vomiting. The usual treatment pursued.

78

Many of those last received from the hospital complain of pain in the head and liver region. Their mouths had been affected at the hospital, but are not so now. The mercurial treatment to be renewed.

Butcher's Island, 14th April.
Thermometer, 90°.

In some of the last 32 patients from Bombay Hospital, the fever seems inclined to run great lengths. Sometimes they appear tolerably well; at others, they labour under severe pain in the head, epigastrium, and liver, with great debility and aversion to food. I tried the bark in several of these cases, but think it did harm, by increasing the pain in the head, and general inquietude. In other cases, I gave small and frequently repeated doses of calomel, with the nitrous acid, which answered the purpose much better. The constipation was best obviated by decoction of tamarinds with natron vitriol.

The patients in the general hospital recover very slowly; and several are extremely ill. The hospital is close, and badly aired; and the men contrive to procure arrac, which they cannot so well do here. I therefore removed over sixteen patients to-day, all very ill; two of them quite yellow, with severe affection of the liver.

B. Island, 16th April.

Most of those last from Bombay Hospital are under the influence of mercury, in which course I persevere. The others convalescing fast.

B. Island, 23d April.

Most of my patients are now in a fair way. We have removed all that are able to bear removal, from the hospital to this island. They all labour under hepatic affection, and are under the influence of mercury, which I continue.

25th April.

We this day embarked all our sick, 84 in number, and dropped down to the middle ground. All our patients in rapid progress to recovery, and all under the influence of mercury.

At Sea, 27th April.

Sailed yesterday for Goa. Our patients in a state of progressive convalescence; thirty-two remained behind at Bombay Hospital."

The perusal of this narrative cannot fail to excite our interest, and strongly arrest our attention. We observe an unwearied assiduity and perseverance in the surgeon, with a coolness of observation, and candour of recital, that greatly enhance the value of the document. It bears on its front intrinsic marks of fidelity. There is no finesse or disguise; he tells a plain, unvarnished tale. Few medical men have gone through more trying professional scenes, in India, than this gentleman, of which the above is but a trifling specimen.

The following reflections on this fever may here be allowed.

First, with respect to its contagious nature; I believe that few, who have been much in hot climates, will hesitate to pronounce, that at its commencement, it did not exhibit a single trait of contagion. A ship comes in healthy from sea; and after being a week in port, where no contagious disease prevails, has all at once eighteen of her crew knocked down in one night with fever, and every night afterwards a similar repetition, more or less, till in a few days—" the decks are crowded with sick, and the effluvia intolerable." From this period it certainly betrays some symptoms of a contagious nature, particularly in the check which it all at once experienced on their landing on Butcher's Island, and in the circumstance of the men who were clearing the ship afterwards, being the principal sufferers. Add to this, the decision of the medical survey, judging it to be contagious. This corroborates my observation respecting the Endemic of Bengal, and which I believe will apply to most other endemics, as those of Batavia, Madagascar, Johanna, West Indies, &c. &c. &c. namely; that they are never originally contagious in their own nature, but may acquire that character occasionally, from accumulation or confinement.

I myself could never see any just cause, why a number of sick men, crowded together, should not generate a contagious disease, as well as a crowd of people in health. That the latter circumstance has sometimes happened, will, I believe, be very generally admitted, notwithstanding the opinion of Dr. Bancroft. But be this as it may, the fever in question was a bilious fever, and one of very considerable violence too. Although the season of

the year was not that of autumnal remittents, yet the land-winds, in all seasons, and in all tropical climates, are more or less impregnated with miasmata; and that these had a considerable share in the fever above described, I entertain no doubt.

2dly; the determination to the liver and brain was here so conspicuous, that it became the prominent feature of the disease; and although not always so unequivocally manifested as in this instance, is ever to be suspected in tropical fevers.

Many of the observations contained in the foregoing narrative, strongly corroborate my ideas on the nature of fevers in hot climates, as detailed in the preceding section. The theory is perfectly applicable to the symptoms of this fever.

In miasmal fevers, the congestions in the head and portal circle were the consequences of impaired energy in the brain and nervous system, as there explained. The same congestions take place here, partly from the same cause (miasmata conveyed by the land winds and acting on the brain) but principally in the following manner:

The extreme vessels on the surface of the body, and by sympathy, of the vena portarum in the liver, having been excited into *inordinate* action during the intense heat of the day, are suddenly struck torpid by the raw, damp, chilling land-winds; the consequence of which is, that perspiration and biliary secretion are checked; the blood determined inwards, is impeded in its passage through the liver, and accumulation ensues in the portal circle, "which is immediately communicated to the brain," as observed in this Gentleman's

narrative more than once, and as I have already explained.* During this period, the bile stagnating in the biliary ducts, becomes viscid; and on the recommencement of a hurried secretion, from emetics or other medicines determining the blood to the surface, often so obstructs the natural passage into the intestines, that regurgitation into the circulation takes place, and tinges the skin yellow. A great deal, however, is forced up through the stomach in a viscid and vitiated state; tending to keep up the gastric irritability, and sometimes to destroy the stomach altogether. This view of the subject explains why the men were almost all seized in the night, and why a nocturnal exacerbation was ever afterwards observed. With strict justice, therefore, and with more propriety, we might denominate the fever in question—"Hepatic," rather than Bilious Fever; and with some slight modification, principally in degree of violence, I shall shew, in a future section, that in reality it is, *alter et idem*, hepatitis itself.

3dly, in regard to the treatment. Although, as I have before hinted, I differ from this gentleman on the exhibition of emetics, and the omission of VS. yet, it must be confessed, that his success in the end was great, and sufficient to confirm him in the opinion, that the practice was the best that could be devised. Indeed, it was the general prac-

* "It is evident," says Dr. Blane, speaking of fever, "from "a number of facts, that the state of the *brain and viscera* "depends on that of the external surface of the body; for a "free state of the pores of the skin, provided it is general, "tends more than any other circumstance to relieve internal "pain, and also to take off delirium." 3d ed. p. 358.

tice of the country. It does not appear that any deaths occurred, either on board or at Butcher's Island; and as eighty-two men were removed back to the latter place from the general hospital, and thirty-two left at Bombay, when the Centurion sailed, the whole number sent at different times on shore to the hospital is accounted for, viz. one hundred and fourteen.

Thus out of full 150 cases of this fever, (which, it will readily be granted, was no very mild or tractable disease) none died, unless subsequently at the hospital, out of the 32 left behind. But if we look to the sequelæ of the disease, resulting from the great hepatic derangement that accompanied the febrile state, there will be some draw-back on the otherwise uncommon success of the practice pursued. The utility of early venesection and purgatives is no where more conspicuous than in obviating these disagreeable consequences, as will be fully shewn in the next section, where they had a fair trial.

One thing, however, is certain; and a very important consideration it is; namely, that as the *mercurial treatment, unassisted*, was here entirely followed, and implicitly confided in, both on board and at the hospital, so it will require some sophistry in its enemies to explain away these stubborn proofs of its extraordinary power and success.

Had this fever, so strongly characterised by yellowness of the skin, bilious vomiting, head-ache, &c. happened in the West Indies, or at Gibraltar, or Cadiz, and in autumn instead of spring; and had any new mode of practice just coming in vogue been strictly pursued, would it not have furnished

a flaming communication to a medical board, announcing the agreeable intelligence, that *yellow fever* might now "hide its diminished head;" for that 150 cases of it, in a very violent form, had been successfully treated *on the new principle,* without the loss of a man! Captains and other officers would have readily attested the truth of this statement; not forgetting a few remarks on the surgeon's skill, and the dreadful nature of the fever. Promotion would have followed, as a matter of course. Error would have been thus triumphant, and *substantially* rewarded, while—— *Virtus laudatur et alget!*

Should this gentleman's successor have shortly afterwards to encounter 150 cases of *real* yellow fever, and 50 of them die, which is very probable, what would be thought of him by the same officers? Into how many delusions has the medical world been drawn in this manner! and what jarring contradictions, and virulent controversies, have resulted from them! The cause has been elegantly stated near two thousand years ago.—

> Omnibus in terris, quæ sunt à Gadibus, usque
> Auroram et Gangem, PAUCI DIGNOSCERE POSSUNT
> Vera bona, atque illis multum diversa, remota
> Erroris nebula.——————————JUV.

CONTAGIOUS FEVER IN HIS MAJESTY'S SHIPS *RUSSEL AND SCEPTRE.*

This Section is introduced principally with the View of determining, whether the Objection to Bleeding, in Fevers of the East, be founded on Facts or Prejudice.

Sec. 8.—In the year 1805, a fever of considerable violence, and of a contagious nature, broke out in the Russel, and was afterwards communicated to the Sceptre, on the Coromandel coast.—It went nearly through both ships' companies.

In the Sceptre it was most ably combated by my friend, Mr. Cunningham, who bled boldly and decisively, till the symptoms were mitigated; this and continued catharsis were almost the only means employed to subdue the fever; after which the strength was recruited with bark. The general symptoms of this fever were as follow:—

The attack was, for the most part, sudden, and without premonitory sensations. Many dropped down upon deck, as if they had been shot through the head; and on recovering a little, expressed a sense of violent head-ache, most commonly confined to the forehead and orbits of the eyes, with oppression on the præcordia. They all complained of giddiness, and great prostration of strength, which occasioned them to totter in their walk.

Rigors and chilliness then ushered in the disease. The patient always complained of the most excruciating pain in the back, loins, and extremities—frequently of the breast, abdomen, and shoulders. The countenance was sometimes pale, dejected, and collapsed; but in nine cases out of ten, there was a fulness of the features, a flush in the face, with a redness in the eyes, which appeared enlarged and projecting, with a sense of pain and dimness of vision. The state of the tongue was very variable: in some quite natural, in others dry; in some it was covered with a white, in others a yellow, slime or mucus. In all cases, where the disease was not checked by the third day, it became extremely foul. Whatever was the state of the tongue, the patient always complained of great thirst, want of appetite, and impaired digestion. There was equally as great variety in the pulse: in some it was nearly natural—in some strong, frequent, and full; in others slow. In general, however, it was both more full and frequent than in health. The skin was always dry and constricted; the temperature, in general, greatly increased. The bowels were sometimes costive, and sometimes loose; nausea and vomiting very common. These were the leading features of the disease; and the treatment was simple, but successful. *Blood was taken till the symptoms were mitigated, whatever the quantity might be; and repeated whenever they returned.* Full and free catharsis all this time was kept up; and when nothing but debility remained, bark and tonics confirmed the cure. In the Russel, where the same fever prevailed, the treatment was as different as the success. The surgeon was attacked

himself; and great numbers were sent to the hospital at Madras, where the ship then lay. The disease was afterwards got under, however, by the prompt exertions of Mr. Edman; but the ship's company felt its effects for years afterwards, and many a victim fell at its unhallowed shrine.

In the Sceptre, as it was generally checked in a very few days, the consequences were not near so lasting as in the other ship's company. A few cases are subjoined, as specimens of the practice, and proofs of the utility of venesection.

CASE I.

JOHN BROOKS, ÆTAT. 20.

26th June, 1805. Was seized about eight o'clock last night with rigor, succeeded by severe head-ache, confined to the eyebrows, with intense heat of skin and insatiable thirst. The eyes are red and inflamed this morning; the surface of the body hot, dry, and constricted; tongue dry, and covered with a white crust; countenance dejected, and lips quivering; pulse quick and confined.—Venesectio ad ℥xx, postea mag. vitr. ʒx.

27th June. The salts operated well, and the febrile symptoms nearly all removed.—Habeat statim ant. tart. gr. ij. pro emet.

28th June. Nearly free from complaint. Let him have ʒij magnes. vit. every two hours.

29th June. No particular complaint.—Continue the salts as before.

30th June. Continues free from fever.—The salts thrice a day.

1st July. Nothing but debility.—The bark mixture, and an antimonial, thrice a day

3d July. Returned to duty. Eight days in the list.

CASE II.

WM. ADAMSON.

June 26th. Was seized about ten o'clock last night with cold shivering, succeeded in an hour afterwards by violent heat, thirst, head-ache, pains in the back and loins, tension of the hypochondria. Pulse at present frequent and strong; countenance swollen and dusky; skin hot, and partially covered with clammy perspiration; tongue loaded with white, slimy mucus.

Venesectio ad ℥xxx, postea magnes. vit. ʒx.

27th June. Greatly relieved by the VS. and cathartic. Complains a little of head-ache—his pulse, skin, and tongue, nearly natural. Habeat ant. tart. gr. ij, pro emetico.

28th June. Complains of some pain in his right side; very little head-ache. Habeat mag vit. ʒiij, omni secunda hora.

29th June. Free from fever—ʒij magnes. vit. ter in die.

30th June. Nausea and vomiting—pulse frequent—skin hot—tongue loaded. Habeat ant. tart. gr. ij, pro emetico; postea magnes. vit. ʒii ter in die.

1st July. Nothing but debility. The bark mixture, with an antimonial, ter in die.

3d July. Discharged to duty. Eight days in list.

CASE III.

JOHN REDFORD, ÆTAT. 21.

July 10th. Seized last night with cold shivering, followed by head-ache, pain in the back and extremities. Pulse, this morning, full, strong, and frequent—tongue coated and yellow—heat greatly increased—countenance very sickly—face flushed and swelled—eyes red and heavy.

Venesectio ad ℥xx, which he did not bear well at the time, but from which he soon afterwards experienced great relief. Habeat magnes. vit. ʒx.

July 11. Complains of the most distressing pains and *sense of weakness* in his limbs. Some head-ache—pulse frequent—skin hot—tongue

furred. Venesectio repet. ad ℥xx, postea sumat magnes. vit. ʒiij ter in die.

July 12. All the symptoms mitigated. Sumat magnes. vit. ʒij ter in die.

July 13. Fever gone; complains of debility. The bark mixture and antimonial ter in die.

July 21. Returned to duty. Eleven days in the list.

CASE IV.

LIEUTENANT KENNEDY.

14*th August*. Was seized last night in his watch with violent head-ache, and such a sense of extreme lassitude and weakness, that he could scarcely walk. To-day, complains of violent pains in his back and loins. Eyes extremely red—face much flushed—intolerance of light. Took 30 ounces of blood from his arm, which relieved the head-ache instantly, and enabled him to bear the light with ease; his eyes became nearly natural, and the flushing of the face disappeared. Sickness and bilious vomiting were now induced, and from which he experienced great relief. He soon afterwards fell into a sound sleep; the skin became quite cool, and the tongue moist. After the sleep, let him have an emetic.

15th August. His complaints almost gone. Let him have a cathartic.

16th August. Free from complaint nearly. Let him have a diaphoretic ter in die.—From this time he recovered gradually."

Out of 212 cases treated on the above plan, three died, and two were sent to the hospital.

The following very interesting Narrative, written by a medical gentleman of considerable talent, who himself suffered a most severe attack of this fever, will help to dispel the prejudice which still exists in the East against venesection.

" During the night of the 15th August, I was teazed with terrifying dreams, though I did not awake till 6 o'clock in the morning, (my usual rising hour) when I found the muscles of my legs and thighs stiff and painful; and, on getting out of bed, perceived the same uneasy sensation all over my body, more particularly in my lower extremities. I had likewise a sense of weakness and listlessness, but neither headache nor thirst. After drinking some tea for breakfast, I thought myself better for a short time, and repaired to the sick-berth, where, from the vast extent of sickness in the ship, I was detained in my professional avocations for

nearly five hours. During the greater part of that time I experienced considerable pain in my back, loins, and the muscles of my thighs and legs. My appetite for dinner was entirely gone, though I had no sickness at stomach, nor loathing of food. I drank a tumbler of weak Madeira negus, and tried to walk the deck; but finding myself unable to persevere, I went to bed till tea-time, when, after drinking two or three cups, I again visited the sick, which detained me some hours, though I was very unequal to the task. On going to bed, I took two grains of tartarised antimony, which operated, but brought off little else than what I drank. I went to sleep, and had considerable rest during the night, but frequently disturbed with distressing dreams. In the morning, (17th) I awoke with severe head-ache, more especially over the eye-brows; deep-seated pain in the orbits, and a sense of fulness in the eyes, with intolerance of light. My face appeared flushed—my eyes red—with throbbing pain in my temples. My pulse at the wrist was firm, but not particularly increased in frequency; felt at the bend of the arm, however, it was remarkably sharp to the touch, with more apparent strength. This circumstance I have noticed in many others.

Early in the morning I was bled to *forty ounces*, from a large orifice;* the blood was dark and firm, but not sizy. When about

* This gentleman is of the middle stature, thin, spare habit, and delicate constitution.—I pledge myself for the strict veracity of every circumstance here narrated.

eighteen or twenty ounces were abstracted, I found the head-ache and weight in the fore-head sensibly diminish; and by the time the whole quantity was drawn off, which did not require more than seven or eight minutes, the head-ache had entirely subsided, and it did not afterwards return. The heat of my skin, which was not greatly increased before, became reduced; but the most sensible relief was a total cessation of pain in my back, loins, knees, and legs; *besides the acquisition of more than double the strength I possessed before: for the debility I felt, previous to venesection, was excessive.* The only uneasiness I now felt, except a sort of unpleasant anxiety which continued to increase for many days afterwards, was a deep-seated pain in my eyes, aggravated by pressure. My head likewise continued light and giddy, but did not prevent my sitting up, or even walking. After venesection, I took a full dose of magnes. vitriolat. which speedily occasioned a plentiful catharsis, and which was kept up through the day, by frequent draughts of warm cunjee water.* No appetite during the day; in the evening sickness, and nausea at stomach: took an emetic of ipecacuan. and ant. tart. which operated, and brought off a quantity of bile. I now felt inclined to sleep; but the night was spent in watchfulness, or short slumbers, broken by frightful dreams. 18th. Found myself very poorly in the morning, though none of the febrile symptoms were prominent. I endeavoured

* Rice-water; denominated cunjee in India.

to keep up all this day, but ate nothing. In the evening found myself worse, and took two drachms of sulphate of soda every two hours, till several loose stools were procured. The night passed without sleep, my imagination wandering greatly. 19th passed nearly in the same manner as the preceding day, and I took the same opening medicine. Night sleepless, as before. 20th. Far from being well, though I could scarcely point out any particular ailment, except the pain in my eyes, and an inexpressible anxiety about the præcordia. Pulse nearly natural—tongue moist and yellow—skin a little hot—appetite gone. Took the same Medicine as yesterday. 21st. Had another sleepless, restless night—felt myself very poorly, yet could not tell how. My anxiety to see some patients who were very ill, induced me to visit them; but the interview did not contribute to my relief, and struck them with astonishment at the alteration in my appearance. 22d. Spent a very restless night, without any sleep, affected with terrible apprehensions; had a considerable degree of laborious breathing, and painful anxiety about the præcordia. Towards evening, the heat of my body much increased, with clammy perspiration. My assistant, conceiving me to be in great danger, advised me to take 15 grs. of bark every hour through the day, with a few glasses of madeira. As the night approached, I got much worse, and he insisted on sitting up with me; he likewise persuaded me to try the effect of an opiate, as I had had no sleep for some nights before.

I took 25 drops (mensura) of tincture of opium, in a glass of port wine, with the usual dose of bark.

Mr. L. appeared to conceive my disease now to be pure debility. Indeed, previous to the attack, I was much reduced, from extreme fatigue of body and anxiety of mind. I was now, therefore, incapable of conducting my own treatment. The opium soon had the effect of quieting me a little, and relieved the laborious respiration, inducing a transient slumber. When I awoke, I beseeched him to repeat the dose, (so much relief did I fancy I had obtained) and it was attended with a similar effect. Mr. L. having left me at 12 o'clock, I awoke about two in the morning (the soporific effects of the last dose being dissipated) and finding myself restless and uncomfortable, I got out of bed, and again repeated the anodyne draught, which was succeeded by another temporary respite from misery. The result of all was, a great increase of mental perturbation, and an impatience for daylight, in order that I might settle my private concerns, which I fancied were in a very deranged state. Accordingly, when my servant came, I got out of bed—began to arrange my papers, write letters, repack my clothes, and even scrambled from my cabin, on the main deck, to my bureau in the cockpit! In fact, I was quite delirious, and immediately carried back to my cot, with proper nurses appointed to watch me. 23d. All this day I continued in a very melancholy state. All I recollect was the difficulty of my breathing, and the strange

appearance which every object seemed to assume.—The lighted candle appeared like a blazing star, with large, diverging radii, surrounded by a dusky *yellow* atmosphere.*

My strength became greatly reduced, and I remained in a state of calm, melancholy resignation, waiting the fatal period which, I was fully convinced, would soon arrest the tide of existence! During these two days (22d and 23d) I was plied with bark and port wine in abundance, but without the least manifest advantage.

The burning heat of my hands and feet was almost insupportable, and my body was covered with a profuse clammy sweat, accompanied by a miliary eruption on my skin. In this state I continued till three o'clock in the morning of the 24th, when I became very bad indeed. I cannot describe my situation, but I was fully impressed with the expectation that each hour would be my last. My breathing was now become so difficult, with a sense of constriction in the diaphragm, and violent palpitation about the heart, that every inspiration was exceedingly oppressive, and every expiration was performed with so much force, that the respiratory

* Does not this imply congestion in the brain, with absorption or non-secretion of bile? Nearly a similar remark is made by the gentleman who suffered so severely by the fever at Bussora, in 1780. "In the evening, with assistance, I got upon the terrace, when the moon and stars appeared of a bright *yellow*, and all objects had that colour throughout the disease." *Vide Narrative in Transactions of a Society, &c. &c.*

organs seemed determined to empty themselves completely—never to be dilated again!*

Before six o'clock in the morning I sent for Mr. L. and assured him, if he did not afford me some relief immediately, death would inevitably put a speedy period to my sufferings, which were then inexpressible. My delirium had now subsided, for I was perfectly conscious of my deplorable situation. I examined my pulse, which I observed to him was hard and oppressed; and grasping my arm above the elbow, I pointed out to him the fulness of the veins, assuring him that venesection alone would save my life. Supposing my debility and emaciation to be insuperable objections to bleeding, I could not persuade him, for more than half an hour, to open a vein; nor even then, till I assured him, before witnesses, that in case of a fatal result, no blame could be attached to him. Induced at last to the operation, he determined to take blood, ounce by ounce. On opening the vein, the effect was astonishing. The blood gushed from the orifice, with an impetuosity I never before witnessed: the bulkhead, and beams of the deck above, were instantly covered with it; and my assistant was so alarmed, that he would have checked the effusion, had I not peremptorily insisted on the contrary. The appearance of the blood, however, struck us both; for it was thin, and as florid as any arterial blood.

* How plainly does this paint the effects of that internal congestion which takes place in all fevers!

On abstracting ten or twelve ounces, we stopped to observe how I felt; and finding myself, as I thought, relieved, I desired him to remove his finger from the orifice, and permit the effusion to continue.——Full twenty ounces were now in the basin, beside what was scattered about the cabin. The arm was tied up, and in a few minutes the blood coagulated in one solid mass, of remarkably firm texture. My breathing was now greatly relieved; but, as I stretched myself on my cot, an astonishing chill ran along my spine, with such extraordinary sensations all over my body, that I believed myself dying! Friction with flannel was applied to my back, and I instantly swallowed twenty grains of calomel, and a large dose of magnes. vitriolat. dissolved in water. I continued very bad till 7 o'clock, when I had a most copious evacuation of hot, bilious matter, which excoriated the parts about the anus in an excessive degree. From that instant I felt astonishing relief; nay, I thought myself perfectly well!—so altered were my feelings for the better. Another similar evacuation succeeded, and removed every vestige of mental alienation. I became perfectly collected; and by 11 o'clock in the forenoon, as easy in my mind as ever I was in my life! Amazed, beyond expression, at the salutary change so suddenly effected, the terrors that had for days together haunted my imagination, now appeared, in retrospective view, like phantoms, or half-remembered dreams."

The Narrative need not be continued: suffice it to say, that as some delirium returned, his head was shaved, a blister applied, and likewise cold

lotions; a scruple of calomel was taken night and morning, for three days, when his mouth became affected, and from that time he convalesced, and recovered with the aid of tonics. He is now a living instance of the good effects resulting from bold venesection, purgatives, and mercurials. I have only to add what I think will be readily granted, that had my ingenious friend used the calomel immediately after the first venesection and cathartics, he would have restored the balance of the circulation, and cured himself as speedily as he cured his patients.—But when the physician comes to prescribe for himself, he may, in general, exclaim with the poet,

> "———Video meliora proboque;
> Deteriora sequor!———"

It is quite evident, that this fever was of a very different stamp from that described in the last section, as "Bilious Fever;" the climate, season, and all other circumstances, were different. It evinced a contagious character from the beginning; in the Sceptre, at least. In the Russel, I have good reason to believe, that it was self-generated, in consequence of great negligence and filth, in various departments. But it soon acquired the power of propagating itself in the best regulated ships. On the Russel's arrival in Madras Roads, (from a cruise off Ceylon, where the fever broke out) the disease was pronounced by a medical survey to be contagious.* But further proofs

* I was in Madras Hospital myself at the time.

of this were soon exhibited. Some caulkers having been lent at this time, from the Sceptre to the Russel, were seized with the same fever that prevailed in the latter ship, shortly after their return to their own. Soon after this, again, the disease spread in the Sceptre's ship's company, and in particular directions from its origin; at last affecting some of those officers who were most exposed, from local circumstances, to its influence; among others, the medical officers and nurses. The Sceptre, however, put to sea, and kept cruising on the Coromandel coast, between Madras and Vizagapatam, which doubtless mitigated, in some respects, the fever.* The determination to the

* When I say that the fever was generated in the Russel from filth, and became contagious afterwards, from the crowding and dirtiness of the sick, I only state the opinion of the medical gentlemen who surveyed the ship and crew at Madras. But I do not hereby attempt to controvert the doctrine, which Dr. Bancroft has taken such pains to establish of late; namely, that *under no possible circumstance*, can accumulations of filth, or the crowding of men, in sickness or in health, generate a contagious fever. I have read with great impartiality, (perhaps with some bias in favor of the author, from the great congeniality of our sentiments on most other subjects) his arguments and elucidations: but I cannot say that conviction has followed. It is true that, by great ingenuity and elaborate research, he has succeeded in throwing an air of improbability, or even ridicule, on certain medical histories and opinions, connected with the above, which still pass undoubted, and fully believed by nine-tenths, or rather the whole of the profession. But let it be remembered, and deplored, that "proofs of holy writ" have too often shared the same fate! On considering the above doctrine in all its bearings, I cannot see a single useful purpose which its undisputed establishment could answer; but I know that it is calculated to produce numerous evils. Dr. B. seems a little apprehensive

Fever in the Sceptre.

liver, and the gastric irritability, were not here very conspicuous; but in the Russel, where early venesection, and copious intestinal evacuations,

of this himself; for he observes, page 102, "I have no desire "to weaken any of the *prejudices*, which tend to promote "cleanliness," &c. &c. And again, "I flatter myself that we "shall all find, within ourselves, sufficient motives to remove "or avoid filthiness, even when convinced that it does not "produce contagious fever." Alas! does Dr. Bancroft forget what the poet says of a still greater evil than dirtiness?—

"Vice is a monster of such horrid mien,
"That, to be hated, needs but to be seen;
"But seen too oft!" &c. &c.

Let us beware, then, of imitating the infidel, who, by subverting what he is pleased to term "*prejudices*,"

"Robs us of that which not enriches him,
"And makes us poor indeed!"

In the month of *February*, 1806, yellow fever, of a very severe description, broke out in His Majesty's schooner Trinidad, at Barbadoes, which was evidently occasioned by the stench arising from dirt, filth, and stagnant water in her hold; for as soon as the latter was washed and cleaned, and scuttles cut, for better ventilation, the fever disappeared. Dr. M'Arthur, physician to H. M. Naval Hospital at Deal, can certify to the truth of this statement.

In respect to the propagation of the fever in the Sceptre, Mr. Cunningham, a decided anticontagionist, has related the above particulars himself; and while he is unwilling to allow, does not attempt to deny contagion. These simple facts do not accord with the following, I think, hazardous sentiment of Dr. Bancroft, *Essay, page* 701.

"The high temperature between the tropics is so unfavourable, I need not say to the generation, but to the *existence* of febrile contagion, that, even when it happens to be brought into that temperature, *it cannot subsist, much less propagate itself.*"

made no share of the cure, these symptoms were by no means rare.

The medical narrative shews, throughout the whole progress of the disease, that its features were those of contagious fevers. And if we can safely bleed in such cases, why not in endemic fevers, where the symptoms are still more violent, and the visceral derangements more frequent, and earlier in their appearance?

This authentic narrative, too, shews us what effects result from the abstraction of twenty ounces of blood, and the exhibition of twenty grains of calomel, at a period of the disease, and in a stage of "debility and emaciation," when the orthodox practitioner, as well as the staunch Brunonian, would have pronounced such a step to be madness, if not murder.—But, "*Magna est veritas, et prevalebit;*" for of all arguments, facts are, in the end, most persuasive.

ENDEMIC OF BATAVIA.

SEC. 4.—The following, as it is the most recent, so, I think, it will be found the most accurate and detailed account, of the Batavian Endemic, that has yet appeared in an English dress. It could not fail to prove interesting at any time, but particularly at the present period, when the British flag waves over this celebrated, but insalubrious settlement; and consequently, when it is likely to be visited by numbers of our countrymen. Independent of this consideration, however, it will be found to contain many curious facts and important observations, well calculated to excite reflection; perhaps, to extend our views in the healing art.

In the month of June, 1800, His Majesty's ships Centurion, Dædalus, La Sybille, and Braave, having on board a detachment of the 12th regiment, consisting of 127 men and officers, sailed from Madras, on a secret expedition; and on the 23d of August following, the squadron anchored in Batavia Roads. The Centurion and Dædalus were placed about four miles from the garrison, to blockade the port; the Sybille kept constantly shifting about, to interrupt the approach of small vessels to the city; and the Braave lay at anchor under the small island of Onrust, about three miles from the main land of Java.

During the first few weeks, the squadron continued tolerably healthy, and without any deaths;

although the crews were much harrassed by night and by day, in chasing the enemy's vessels, rowing guard, and loading or unloading the prizes off the island of Onrust.* The weather was pretty temperate at this time; the thermometer, in the shade, generally ranging from 82° to 87°, with regular sea and land breezes. When the latter, however, came off from the low, swampy grounds about Batavia, early in the mornings, it brought with it a thick mist, accompanied by a very fœtid smell; all of which would gradually go off, as the sun rose, and the sea breeze set in. During the prevalence of this fœtid mist in the morning, many people would complain of slight indisposition in the head and stomach, which likewise went off as the sun came out.

About this time the Braave disembarked an officer and some men of the 12th regiment, on duty at the island of Onrust, where a temporary hospital was established; and here the first appearance of *endemic* fever was observed. It was not, however, in any alarming degree, but chiefly confined to those who lived intemperately; as none of the officers of that ship were attacked, though they frequently slept on shore. Some of the people having broken open a spirit-store on the island, were in the habit of getting intoxicated, in which state they often exposed themselves to the intense heat of the sun, by day, and the damp, cold dews of the night. A few of the 12th regiment fell vic-

* Contrast this with what happened to the crews of the Russel, Albion, and Powerful, at the same place, in 1806, when their sanguine hopes of surprising the Dutch squadron were suddenly dissipated. Vide sec. 1.

tims to fever, much aggravated, if not occasioned by irregularity; in consequence of which, an idea was very generally propagated, that the island was peculiarly unhealthy.

On the 14th September, the Centurion relieved the Braave, and took charge of the hospital, where twelve cases were left behind, most of them very ill, and some of whom died. Prepossessed against the island, the surgeon of the Centurion declined landing any of his own sick there, at first; till, finding that some of the Braave's, who were exceedingly ill, recovered, and that none of the nurses were attacked at the hospital, he ventured to land six of his worst patients (bilious remittents and fluxes), who all did well. He therefore became convinced, that the reported insalubrity of the island was unfounded, in a great measure, at least.

Unfortunately, however, the commanding officer of the expedition, conceiving that the vicinity of the island to the main land was the cause of sickness, (which supposition seemed corroborated by the fœtid mists that daily came off from thence to the island) ordered the sick to be removed, on the 28th September, to the small island of Edam, situated nine miles out to sea; a circumstance that he thought must insure its salubrity. Here the tragic tale commences;—but first let us glance at the medical topography of the two islands. Onrust is a small island, three miles from the main, well cleared of trees, underwood, and jungle; nearly flat, and free from swamps or marshes, except one very small spot, which, however, is daily covered twice by the tides. On this island there were many excellent buildings, where the conva-

lescents could be separated from the fever cases, and where all could have abundance of space and ventilation. From the fœtid exhalations, which were conveyed by the land winds from the neighbourhood of Batavia, the sick were easily secured, by closing certain apertures in their apartments, till the sun dispersed the vapours in the morning; after which, there did not appear to be any danger from the miasmata disengaged during the day. Edam, on the other hand, though farther out of the reach of Batavian exhalations, is covered with trees, long grass, and jungle, having a part of the island itself in a stagnant, marshy state. The buildings here were indifferent, and only one long ward could be found, for the sick and convalescents; in consequence of which, the latter class of patients experienced all those dire effects produced by the depressing passions, for ever nurtured by the melancholy scenes of death, which this fatal spot too constantly presented to their view! Thus, in running from a doubtful danger, they precipitated themselves on certain destruction. In leaving Onrust, (a cleared space) to avoid the effluvium of Batavia, weakened and diluted by a three miles passage from its source, they settled on the jungly and marshy island of Edam, where pestilent miasmata, in a concentrated form, issued from every foot of ground around them! The fatal effects which followed, were predicted by an intelligent surgeon on the spot, but his suggestions were disregarded or overruled; *distance* from the main being held paramount to all other considerations.

Of sixty soldiers (12th regiment) landed at different times, *in health,* to do duty at Edam hospital, and other buildings on the island, between the

1st October and 12th November, thirty-one died. (besides five or six at Onrust, previously.) Of the remaining twenty-nine, embarked on breaking up the blockade, (12th November) twenty-two died at sea; the other seven were sent to Malacca hospital, where all, or nearly all of them, shared the same fate!—In short, only sixty-two returned out of the whole detachment; the rest having fallen ingloriously, without drawing a sword!

All the soldiers getting ill on Edam, sixteen marines were landed from the Centurion, to do night duty, as they expected an attack from the Dutch gun-boats. The whole of these were seized with the fever, and thirteen died; two recovered, and one was sent to Malacca Hospital.

The loss of seamen I have not been able exactly to ascertain; but it must have been considerable. Almost the whole of the sick [twenty-eight in number], who were removed from Onrust to Edam, [28th September] died. And as nine officers, including the surgeon, Mr. Cornish, who were doing duty at this dreadful island, perished, we may form some idea of the general mortality.

It is worthy of remark, that the Dædalus, in which twenty-five of the detachment from the 12th regiment were embarked, did not land a man on any of the islands, nor did one of her men die, or suffer an attack of this endemic. Such is the outline of its history; the following are the features of this fever, principally as it appeared at Edam, its head-quarters. They were noted on the spot, by a very intelligent surgeon of the expedition, who I believe is now in England, and who had ample opportunities of observing the disease in all its shapes, as affecting various constitutions.

Endemic of Batavia.

"The patient, without much previous notice, (if the first attack) is suddenly seized with giddiness and cold chills—sense of debility, and vomiting, with pain over the orbits, and in the epigastric region. He frequently falls down, and is insensible during the paroxysm; his body covered with cold, clammy sweats, *except at the pit of the stomach, which always feels hot to the palm of the hand*—the pulse is small and quick. On recovering a little, this train of symptoms is succeeded by flushings of heat—increased pain over the orbits, and in the sinciput—pain and a sense of internal heat about the stomach and præcordia—oppressed breathing—the lower extremities, at this time, not unfrequently covered with cold sweats. The eyes now become, as it were, protruded, and the countenance flushed. Retching, and at length, vomiting of discoloured, bilious matter, comes on—the tongue white and furred—the abdomen tense and full, with pain in the loins and lower extremities. The length of this paroxysm varied from six to eighteen hours, and was generally succeeded by cold rigors—very often low delirium, preparatory to the next stage or paroxysm of the fever. The intellectual functions now became much impaired, the patient not being at all sensible of his situation, or of any particular ailment.—If asked, how he is? he commonly answers, "Very well;" and seems surprised at the question. This was a very dangerous symptom, few recovering in whom it appeared. In this stage all the symptoms become gradually, often rapidly, aggravated; particularly, the head-ache—pain and tension in the epigastric region, and vomiting. Some patients, *on shore*, were carried off in 18, 24, 30, or 40 hours,

and others not till as many days after the attack, especially when removed on board, from the more noxious air of the island. A great proportion changed, in a few days, to a bright yellow; some to a leaden colour: other cases terminated fatally, in a very rapid manner, too, without the slightest alteration in that respect. Generally, however, the change of colour indicated great danger. Vomiting of black bilious stuff, resembling the grounds of coffee, frequently commenced early, and continued a most distressing symptom; too often baffling all our attempts to relieve it. In some, a purging of vitiated bile, or matter resembling that which was vomited, occurred; in a great many, a torpor prevailed throughout the intestinal canal—rarely did any natural fœces appear spontaneously. The pupil of the eye was often dilated, and would not contract, on exposure to a strong light—in others there was great intolerance of light:—both indicated danger. Low delirium was a pretty constant attendant on this fever, from first to last; sometimes, though more rarely, raging high delirium.* Mr. Carter's† was an instance of the latter, which he had in a very terrible degree, with red, inflamed, and protruded eyes—great inquietude—hot, dry skin—small, quick pulse; his mind actively employed about the stores and prizes on shore, of which he had the charge previous to his illness. During the violence of the paroxysm, he was quite insensible to every thing that was going on around him, constantly grasping at, or wrenching those objects

* Vide Cases V. and VII. † Case XI.

within his reach. He made frequent attempts to get overboard. In the low delirium, also, the mind is much occupied on vocational subjects: if a seaman, about the ship's duty; if a soldier, about his regiment, marching, &c. &c. Some patients were comatose from the first attack; in others, the fever was ushered in with convulsions, delirium, and cold sweats, without any intervening heat of the surface, except at the pit of the stomach, which, in most cases, was burning hot to the touch, and accompanied internally by a similar sensation according to the patient's own feelings.

Hæmorrhage from the mouth or nose seldom occurred; in two cases, which terminated fatally, the blood did not coagulate, but tinged the linen yellow.* Aphthæ appeared in a few cases, and indicated danger. Subsultus tendinum often attended both on the high and low delirium. The pulse never could be depended on. In the very last stages it has been regular; but, in general, it is small, quick, and either hard, or stringy and tremulous; sometimes, during the re-action of the system, full and hard. Deafness was very common, and an unfavourable symptom. Two kinds of eruption appeared about the lips—one, such as we often see at the decline of common fevers; the other, consisted of small black or brown spots round the lips, and was likewise a dangerous, indeed a fatal symptom. With this eruption, the teeth, tongue, and fauces generally became covered with a brown or black crust, and the breath intolerably fœtid. Locked jaw took place in two

* Case VIII.

cases at Onrust Hospital, but the patients were insensible of it:—both died. *The brain appeared the organ chiefly affected at first—the stomach and liver in succession.** In those cases which occurred on board, and where the patient had not *slept* on shore at Edam, the symptoms were much milder, and the fever resembled more the bilious remittent of other parts of the East. A great torpor prevails generally throughout the system, with the low delirium; blisters, medicines, &c. &c. having little effect on the patient, who appears as if intoxicated. When roused, he recollects the person who is speaking to him, for a moment, and answers in a hurried, incoherent manner; then lies on his back, his mouth and eyes half open; both fœces and urine often passing involuntarily. I have seen them remain in this state for hours—nay, for days together, scarcely moving a single voluntary muscle all that time. In this melancholy situation, Lieut. Neville, of the 12th regiment, lay for some days previous to his death. Never was there a disease so deceitful as this fever: I have frequently seen instances where every symptom was so favourable, that I could almost have pronounced my patient out of danger; when, all at once, he would be seized with restlessness—black vomiting—delirium—and convulsions—which, in a few hours, would hurry him out of existence!

This was the case with Mr. Broughton, purser of the Dædalus, who died of the Batavian endemic

* This accords with my observations on the Bengal Endemic, and with the mode in which I supposed miasmata act on the human body. § 1, pages 76 and 96.

at Edam Hospital. On the seventh day of his illness, he took a change for the better; and every thing was promising. The morning before he died, he expressed himself greatly relieved; and called for some mutton-broth and sago, both of which he ate with a good appetite;* spoke rationally—and was in good spirits. Towards evening the delusion vanished—restlessness—black vomiting—delirium and convulsions supervened, and carried him off before morning! I have seen many cases terminate in this manner. Two patients at Edam complained of a diminished size of the brain, and that they felt as if they could shake it about within the cranium:—both died. Mr. Cornish, surgeon of the Dædalus, who had charge for a while of the hospital, was one; he died on the seventh day of his illness.

The fatal terminations generally happened on the third—fifth—seventh—ninth—and not unfrequently the eleventh and thirteenth day; if they passed this period, they usually lingered out twenty or thirty days. But very few indeed ever ultimately recovered, who had slept on shore, and were attacked at that dreadful island, Edam! No constitution was exempted from the assault of this fever. It seized with equal, or nearly equal violence, on those who had been many years in India, and on the most robust and plethoric, or newly-arrived European. Even the Dutch officers and Malays, who had been drawn from different parts of Java, and whom we had prisoners at Edam,

* Hunger is a fatal symptom in the Yellow Fever.—Vide § 5.

fell victims as fast, or nearly so, as the English. Several officers, seamen, and soldiers, were sent on board from this island, in hopes that the change of air might mitigate the disease. Many of even the worst cases of these would promise fair for a few hours in the forenoon; but night always dispelled our hopes, for then the patient relapsed as bad as ever:—they almost all died. But their fate was considerably procrastinated by the change; many of them lingering out a great length of time on board, sinking at last from the consequences of the fever, rather than from the fever itself. Several of them changed into obstinate intermittents at sea, with great derangement of the liver, spleen, and bowels. Indeed the liver, in most cases, seemed affected from first to last in this fever; but in all protracted states of it, this affection became the prominent symptom. In those that were cut off during the first 18, 24, or 30 hours, the brain appeared to be the organ oppressed. With respect to the question, whether or not this fever was contagious? I am decidedly of opinion that it was not so. For if all the nurses and medical attendants of the hospital at Edam died, it must be remembered, that they were equally exposed to the cause of fever, whatever it is, as the soldiers and seamen who did duty at the barracks and other buildings, or who were sent to the hospital for other complaints; all, or nearly all of whom, shared the same fate. Moreover, what I conceive decides the question, is this; that although, on our raising the blockade of Batavia, great numbers of sick, in every stage of the fever, were brought on board from the hospital at Edam, yet not a single nurse, or medical attendant of any

description, ever suffered the slightest attack of fever; nor did any circumstance transpire, that could in the least favour the idea of contagion, notwithstanding that the great accumulation of sick on both decks, rendered it a matter of impossibility to separate them completely from those who were well, nor at all times to prevent a considerable generation of effluvia.

From our first arrival at Batavia, in August, until our return to Malacca, in January following, we only buried one man of fever,* who had *not slept on shore at Edam, Cuypers, or Onrust islands; whereas almost every person, who slept even a single night at Edam, died.* No ill effects were experienced from going on shore in the day-time, or among the sick at the hospital. I myself regularly visited the sick at the hospital of Edam every day, with perfect impunity, till one night, that I staid rather late, attending the unfortunate surgeon of the Dædalus; in consequence of which, I was three days afterwards seized with the fever, but recovered by mercury carried to ptyalism. I think it highly probable, however, that had I slept on shore, no medicine would have saved my life.

The night before we raised the blockade, parties of men and officers were sent on shore at Edam, to blow up and destroy the works and buildings on the island, which operations detained them about half the night there. Most of these were shortly afterwards attacked with the fever, but all recovered except one; (Mr. Parry, midshipman) his fever, too, was checked by mercury; but being

* Case XIII.

of a diseased habit, he relapsed when the soreness left his mouth, and died. The gunner, carpenter, and other officers, were all seized with the fever; but the former, being principally employed among fires, in laying trains, blowing up, &c. &c. had the disease in an infinitely milder degree than any of the others.

One circumstance more is so singular in itself, and so much attracted our notice at the time, that I think it deserves commemoration. *Of all the people or patients who slept at the fatal island of Edam, four only, to the best of my knowledge, escaped the fever entirely, and returned to Malacca. These were two obstinate venereals, and two chronic dysenterics; all under the influence of mercury, for some time before I sent them to the hospital. Their complaints did not get better in the least on shore, so that they continued to take mercury there. They slept in the same ward with the fever patients all the time, but never had the slightest symptom of fever themselves.* One other patient at the hospital did not catch the fever, but he was sent there in the last stage of phthisis, and died a few days after he landed.

I have omitted to mention, that despondency, or anxious timidity, very frequently accompanied the access of this fever; while a placid resignation to their fate, or rather, an insensibility to their situation, marked its fatal close.*

* Vide Cases XIV and XV, where this is exemplified. The same thing is observable in the yellow fever of the West Indies.—Vide next section.

TREATMENT.

In this, as well as in the common fevers of India, where a redundancy of vitiated bile might be suspected lurking in the primæ viæ, I have always prescribed a solution of salts and emetic tartar, as the first medicine, which generally operated both upwards and downwards; and subsequently, by perspiration, in a short space of time, to the great relief of the patient. On the same evening, an anodyne antimonial draught (vin. ant. ʒi. tinct. opii, gut. xv. vel xx, aq. menth. ℥ij) was exhibited, to allay the irritability of the stomach—promote the cuticular discharge, and dispose to sleep. Bleeding I was afraid to attempt, as in the *only case*, to my knowledge, where it was tried in this fever, the patient very soon afterwards died, in a state of putrescence. *From this circumstance, and from some accounts which I had read, of its bad effects in fevers of the West Indies, I gave up all idea of the lancet.** I therefore had recourse to evacu-

* He probably alludes to Chisholme. "The ardent heat of the surface, the oppressed hard pulse, the pain of the side, the oppression of the præcordia, the headache, and the throbbing of the temples, seemed strongly to indicate bleeding. *Very little experience*, however, was sufficient to shew the *impropriety* of it." Chisholme. I may add, that *very great experience* has, since that time, evinced its *propriety*, even to a demonstration.—Vide next section. Its failure was probably owing to the timid manner in which it was performed.

ations from the bowels, and from the skin. For the latter purpose, I tried various medicines; such as the saline draughts, with sp. æther. nitros. tepid bathing, with diluents, &c. &c.; but I found none equal to small doses of antimonial wine, and tincture of opium; given frequently, with plenty of warm, diluent drinks, and occasional pediluvium. By perseverance in this plan for a few days, *in the less violent cases*, the skin has become relaxed, with an equally diffused perspiration—the pulse soft and natural;—the pains and delirium have disappeared; and nothing but debility remained, which was soon removed by bitters—bark, wine, and nourishment.

But alas! in the more concentrated forms of the disease, by which we were now surrounded, this practice was far from successful. *For here the patient hourly lost ground; and seemed to be hurried out of existence by the local effects of the fever; chiefly confined to the brain and liver. What the nature of these local effects was, I am unable to say. They appeared to be either inflammation—an accumulation—or a greater determination of blood to those organs, or perhaps something compounded of all these; and evinced by the red, inflamed state of the eyes—the delirium—the oppression, tension, and often pain, in the epigastric and hypochondriac regions.** Finding, then,

* I need hardly remark, that these conclusions, the result of observations made at the bedside of fever, and in an extensive field, form a striking coincidence, and a corroboration of the theory of fever which I formed in the same school of experience.—Vide sect. 1, page 97.

that bleeding would be attended with fatal consequences, and that antiphlogistics and tonics were alike ineffectual, I was forced to have recourse to other means; and knowing that mercury was a powerful specific against local inflammation, particularly of the liver, as well as a most valuable medicine in bilious remittents, where visceral obstructions were forming, or formed, I placed my last hopes in the employment of this active remedy. I generally prescribed calomel combined with opium, and antimonial powder, in some few cases with camphor, in the following manner:

Calomel, six or eight grains.
Antimonial powder, two grains.
Opium, one grain.

These were made into a bolus, and taken every three, four, or six hours; so that from twenty-four to thirty-six grains of calomel might be taken in the course of the day and night. If a salivation could be excited in a few days, the patient experienced an immediate change. The fever entirely left him—the pains abated—the intellectual functions were restored—the stools became natural, and nothing but tonics, nourishing diet, and change of air, were wanting to perfect the recovery. This last desideratum, (change of air) the most important of all to convalescents, was least of all within our power, while we inhaled the noxious atmosphere of Batavia.

Here, then, we had the mortification to see our patients, after being rescued from the jaws of death—every symptom of fever gone, and

after being several days convalescent, with a relish for food—relapse, one after the other, *as the soreness left their mouths,* and die almost to a man!

Many instances, however, occurred at Edam Hospital, where mercury was prescribed in large quantities, *after other medicines had failed in the beginning,* without affecting their mouths; in which case, they all proved fatal. I have sometimes prescribed bark and wine, in conjunction with mercury, to support the system during its exhibition, and I think that in several instances it accelerated the ptyalism.* Blisters often gave temporary relief to local symptoms, such as pain—hepatic affection, and vomiting. They likewise served as stimuli, to rouse the patient from stupor and delirium.

In the early stage of this fever, the tepid bath was used with advantage; but in advanced states of the disease, I think it did injury, by increasing debility. I have frequently experienced the greatest benefit from sponging the body with cold vinegar and water, where there was low delirium—cold, clammy sweats—and stupor. In such cases the pulse, from being 120 or 130, would fall to 90, and a refreshing sleep succeed;—but night always brought on the usual exacerbation. Gentle emetics of ipecacuanha, I have often found to relieve the delirium, oppressed breathing, and load at the stomach or præcordia, even at an advanced period of the

* This is similar to Dr. Balfour's plan.—Vide sect. 1, page 54.

disease. *In cases where great determination to the brain appeared, I have often given brisk doses of calomel and jalap, with surprising good effect. Indeed, evacuating medicines of every kind, where they do not tend to debilitate the system, are extremely useful in the early stages of this fever.* Wine, porter, and nourishment, did more harm than good, except in the advanced periods of the disease, when porter was always beneficial in checking the vomiting, and allaying the irritability of the stomach. Bark, in many cases, did much harm, by bringing on or increasing the vomiting, and other dangerous symptoms—besides checking the perspiration, and rendering the patient hot and restless.* In some cases, however, I think it produced good effects, especially when guarded with opium, to make it sit on the stomach.

But could the patient be removed from the noxious air of Batavia into a purer atmosphere, during the mercurial course, I should not have a doubt in the efficacy of mercury; for it was the only medicine that ever bade fair to check the ravages of this dreadful fever. Without this change of air, I believe that every human means will have but a temporary effect; and, excepting mercury, few of them will have even that.

It is necessary to say, that copious ptyalism must be brought on, otherwise it will prove inefficient. I tried the nitrous acid, as recommended by Dr. Scott of Bombay, but cannot say any thing in its favour. The Dutch medical

* Vide Cases VIII and XVI, as examples.

practice at Batavia, consists in giving camphor in weak julep; making the patient drink quarts of it in the course of the day, till the perspiration teems from every pore of his body; keeping him all this time in a close room, well covered over with warm bed-clothes, and without paying the least attention to any urgent symptom, or other means of arresting the fever. But this plan was very unsuccessful; for the mortality in the garrison of Batavia, while we lay before it, was dreadful, particularly among the European soldiers.

Previous to our appearance, the Dutch, in general, resided a few miles up the country, on elevated ground, and out of the reach of those pestilential vapours that issue from the low swamps in the vicinity of the city. There they enjoyed tolerable good health; but our arrival forced them into the garrison, where they had hard duty, day and night, in keeping a look-out upon us, and throwing up works to defend the place. The fever, therefore, swept them off in prodigious numbers, so that their loss far exceeded ours. In an action with some of their gun-boats, we had a few men wounded, who did well on board. But this seems to be a rare circumstance; for one of our officers being on shore with a flag of truce, was asked by the governor, how our wounds succeeded; and being informed that they were all nearly well, he seemed quite astonished, and would hardly give credit to the account; declaring, upon his honour, that during fifty years which he had passed at Batavia, he never knew a single instance of a man surviving a wound received in the noxious

air of the city and its neighbourhood.* He lamented much his not having any European surgeon on the island; and on our raising the blockade, made very tempting offers to any medical gentleman who would remain behind.† But I am inclined to think, that had any one accepted the offer, his reign would have been very short, and that he must soon have fallen a victim to the climate. He also expressed great surprise, that our mortality in the squadron was not greater; as he calculated on our losing at least half of our men during our long stay there. The Dutch ships generally lost from half to three-fourths of their crews, between their arrival at Batavia, and their departure for Europe.

CASE I.

THOMAS DONNELLY, (12th Regt.)

Onrust Hospital.

September 15*th*, 1800. Has been ill two or three days before I took charge of this hospital. His symptoms, at 5 P. M. to-day, are as follow:

* This corroborates the circumstance mentioned by Lind, of the slightest scratches turning into dreadful ulcers, on board the Panther and Medway, in 1764.

† When Sir George Staunton was at Batavia, the principal physician and the principal clergyman of the place, had originally been barbers.

Pulse small, eighty-six in the minute—tongue white, tremulous, with red edges—severe pain in the head and stomach—hot and dry skin—great mental despondency—frequent vomiting—body has a diagreeable smell. Let him have æther vitr. ʒj; tinct. opii, gt. xx; aq. menth. ℥ij, immediately. This instantly allayed the irritability of the stomach.

16*th*. Passed a bad night—no sleep—this morning, pain at the stomach and in the head—bowels uneasy, with fixed pain about the umbilicus. Magnes. vit. ℥j, which operated. A blister to the back of the neck.—At night, the æther and anodyne draught as before.

17*th*. A restless night—no sleep—severe vomiting and purging this morning, of fœtid, bilious stuff, with pain in the region of the liver. High fever—delirium. Calomel, grs. viij, pulv. antim. gr. ij, opii gr. j; fiat bolus, ter in die sumend.

18*th*. Vomiting and purging allayed—other symptoms nearly the same. Continued this treatment, without any other medicine, till the

21*st*. This day his mouth is sore—fever subsided—pain in the region of the liver nearly gone—vomiting and purging ceased. All the symptoms favourable.

22*d*. Spits free—appetite returned—all bad symptoms gone; complains only of debility.—Convalescent list, with nourishing diet.

He continued to improve till the 28th September, when he was sent with other convalescents to Edam Hospital, where he caught the fever, and died in a few days, dreadfully putrid.

CASE II.

ROBERT HUNTER, (12th Regt.)

Onrust Hospital.

15*th September*, 1800. Has been ill three days with fever. Complains now (5 o'clock) of pain in the head and stomach—pulse 86, and small—frequent delirium—hiccup—subsultus tendinum—skin tinged yellow—body smells fœtid—passes blood by stool. Anodyne antimonial draught immediately—bark infusion every two hours.

16*th*. No sleep—all the symptoms as yesterday—bark continued—port wine ad libitum—sponged the body—at 2 P. M. worse—lies in a state of stupor—can scarcely be roused—skin a deep yellow—cold, clammy sweats—burning internal heat at the pit of the stomach—low delirium—pulse 100, small and irregular—stools intolerably fœtid.—After sponging, the pulse fell to 86—bark and wine continued.

17*th*. Restless night. This morning, hiccup—black vomit—subsultus tendinum—skin a bright yellow—pulse small and fluttering—difficult deglutition—fœtid smell from the body. Died on the fifth day of his illness.

CASE III.

CORPORAL STONEHAM, MARINE, H. M. S. BRAAVE.

Onrust Hospital.

September 15*th*, 1800. Was taken ill on the 12th inst. Symptoms now as follow:—pulse 100, small—frequent vomiting—severe pain in the head, stomach, loins, and limbs—deafness—skin hot, dry, and changing yellow—great inquietude—can with difficulty be kept in bed—eyes yellow—incoherence. Blisters to the head and stomach—anodyne antimonial draught at bed-time.

16*th*. No sleep last night—vomits every thing this morning—skin hot, dry, and of a deep yellow—head-ache—delirium—blisters rose, but no relief—saline effervescing draughts every two hours—at 2 P. M. vomiting checked—all other symptoms unfavourable.

17*th*. A better night. This morning, complains of head-ache and debility—pulse small—slight bilious diarrhœa—intellects impaired. Decoction of bark, with tincture of the same, every two hours. At 2 P. M. vomiting returned—skin hot—fulness about the liver. At 8 P. M. the calomel opium and antimonial bolus.

18*th*. Slept a little the first part of the night—restless during the latter. At eight this

morning, lies in a state of stupor—fœtid smell from his body—clammy sweats—skin quite yellow—burning heat at the pit of the stomach—tried the bark again, which was rejected—ordered the calomel bolus thrice a day. When asked, how he does? replies, that he is "very well."

19*th*. Passed a tranquil night—this morning, stomach uneasy—pulse soft and regular—skin has a warm and equally diffused moisture on it—tongue looks clean—he got up, and walked a few minutes in the garden, (the weather being very fine) and seemed much better.—I have sanguine hopes of his recovery. The calomel to be continued. At 2 P. M. not so well—complains of uneasiness in the region of the liver—the abdomen has a tense, full feel—at 3, P. M. becomes very restless—a purgative enema, which operated—at 6, P. M. cold, clammy sweats—hiccup—subsultus tendinum—convulsions—death. Died on the 7th day's illness. A most dreadfully fœtid smell issued immediately from his body, and he was buried without delay. He was a strong, plethoric man, and had lived very intemperately.*

* Can any one doubt that *early* venesection, purgatives, and mercurials, would have gone far to have saved this patient?

CASE IV.

JAMES DRYDAM, MARINE.

Onrust Hospital.

September 15th, 1800. Has been ill for a day or two. At five this evening complains of head-ache and great debility—pulse 90, small and irregular—tongue white, and much furred —an emetic had been given him this morning, which relieved his head a little—his skin changing yellow—has a fulness, with internal heat at the pit of the stomach. The anodyne antimonial draught at bedtime.

16*th*. Passed a good night. Symptoms more favourable this morning—skin warm and moist complains of much debility. The bark infusion every two hours, with an occasional opiate.

17th. Had a tolerable night—this morning complains much of his head, with general debility—pulse small—a bilious purging—great deafness—intellects much impaired—at 2, P. M. became hot, dry, and restless—omit the bark, and let him have a saline cathartic, which operated—at 6 P. M. he is better—anodyne antimonial at bedtime.

18*th*.—Passed an indifferent night. This morning, much debility—cold, clammy sweats—great head-ache—deafness increased—pain and

heat at the stomach—bark infusion, as on the 16th.

19*th*. Symptoms nearly as yesterday—rejects the bark in every form, with great aversion—relishes port wine, which is allowed him—at 2 P. M. very restless—oppression and fullness about the region of the liver, and all over the abdomen—skin hot, dry, and constricted.—A purgative enema—at 8 P. M. calomel opium and antimonial bolus.

20*th*. Passed a restless night—fever very high this morning—head-ache distressing—delirium—very great deafness—passed some green fœtid stools—fixed pain about the umbilicus—the calomel bolus ter in die, with blister to the head—at noon, no better—at 6, P. M. more composed—the calomel bolus to be continued.

21*st*. Little or no alteration since yesterday—the calomel bolus to be continued thrice a day.

22*d*. Severe pain in the forehead, and about the region of the liver—cold chills, alternated with flushings—skin quite yellow—countenance sallow—heavy and dejected—the calomel regularly continued thrice a day, till

26*th*. Since the 22d he has been very ill, and all the symptoms unfavourable—this morning ptyalism came on, and every thing changes for the better—hearing returned—head-ache gone—tension and pain in the epigastric region and right side have subsided—pulse is natural—skin moist

and warm, but still yellow—omit the calomel—an anodyne at night.

27th. Mouth sore, and spits free—complains only of a slight pain in his right side, and some uneasiness in his bowels before he goes to stool—yellowness goes off—keen appetite—nourishing diet.

28th. He was walking about as a convalescent, and sent this day to Edam Hospital, where he afterwards caught the fever, and died.*

CASE V.

JAMES BARRETT, (12th Regt.)

Onrust Hospital.

September 15th, 1800. Has been ill about forty-eight hours. At 5 P. M. to-day, a mad delirious fit—with difficulty can be kept in bed—tongue tremulous, white and furred—eyes red—complains frequently of his head, with pain in the epigastric region—skin hot, with some perspiration on it—has been taking bark three or four times to-day—head to be shaved and

* Notwithstanding the great disadvantages under which the mercury laboured here, from the lateness of its exhibition—the previous irritation of bark and wine, together with the want of copious intestinal evacuations, it finally triumphed over the disease. No one will say that this was a slight attack. The next case is still more interesting.

blistered—pediluvium—an æther and anodyne draught at bedtime—the bark infusion to be given through the night.

16th. Had a very restless night—pain in the head excessive, and not relieved by the blister—calomel, gr. x, jalap ʒj, statim sumend—at 1 P. M. it operated, and brought off numerous, copious, fœtid, green stools. At 6 P. M. head not yet relieved—a profuse perspiration—pulse 90—tongue brown—talks incessantly, in the most incoherent language—all the symptoms very unfavourable—the anodyne antimonial at bedtime.

17th. He lay in a state of stupor all night—this morning, skin warm, and a little moist.—decoction of bark every two hours, which he retains well on his stomach. At 1 P. M. lies in a state of stupor, and with difficulty can be roused—mutters between his teeth incessantly—eyes inflamed and prominent—abdomen tense and full—pulse frequent and hard—tongue dry—bowels opened by an enema—continue the bark—and to take calomel, gr. x, opii, gr. j, at bedtime.

18th. First part of the night more composed—restless in the latter—this morning, stupor as before—lies on his back, with mouth and eyes half open—with difficulty can be roused—body has an offensive smell—cold, clammy sweats—skin changing yellow fast—pulse, small and quick—when roused, will take whatever is offered—the decoction of bark through the day—repeat the calomel and opium at bedtime.

19th. Passed a tranquil night—repeated the calomel this morning—the decoction of bark to be continued—at 1 P. M. omitted the bark, and exhibited a saline cathartic, which brought off three copious fœtid stools—at 8 P. M. he appears better—he is perfectly sensible—skin a bright yellow—but is warm, and has an equally diffused moisture on it—repeat the calomel and opium as in the morning.

20th. Passed an easy night, but had no sleep—at 8 this morning, he seems better in every respect—continues sensible—repeat the calomel—also decoction of bark—at 1 P. M. uneasiness in his stomach and bowels—fever increased—great incoherence in language and ideas—*omitted the bark; prescribed a cathartic, which brought off many copious, fœtid stools—at eight in the evening, a remission of the fever—other symptoms more favourable*—the calomel continued.

21st. Passed a good night, and is better this morning—repeated the calomel twice to-day—with bark decoction—at 8 P. M. an exacerbation of fever—repeat the calomel.

22d. Passed a tolerable night—a mercurial odour on the breath—skin becomes less yellow, with equally diffused perspiration—the calomel and decoction as before.

23d. Mouth sore, and all symptoms favourable—yellowness goes off the skin—perfectly sensible—no head-ache—stools more natural—

craves for food—continue the calomel, with a pint of wine and nourishing diet.

27th. Ptyalism did not come on copious till to-day—he is now free from every complaint, except debility—appetite good—spirits free—yellow tinge almost gone—omit all medicine—convalescent list.

28th. He was this day sent, with other convalescents, &c. to Edam Hospital, where he afterwards caught the fever. He was removed immediately on board—the same plan of treatment adopted, and as soon as ptyalism appeared he began to mend.—He was one of the very few who ultimately recovered from the fever of Edam.*

CASE VI.

WM. WARD, MARINE.

Onrust Hospital.

September 18*th,* 1800. At 1 P. M. to-day, complained of pain in his head, back, and loins—skin burning hot—tongue foul—pulse small and quick—pain at the stomach—nausea and retch-

* I leave it to the candour and judgment of the reader, whether the cure is to be attributed here to the bark decoction, or to the intestinal evacuations and mercury. This is a very valuable case—for it was a very formidable one: on the 18th it appeared nearly hopeless.

ing—an emetic, which operated well—at night the anodyne antimonial draught.

19*th*. Passed a restless night—this morning complains much of his head—severe purging and griping—skin intensely hot—tongue foul and dry —the emetic-cathartic solution, which operated well both ways—at 8 P. M. the anodyne antimonial draught.

20*th*. Passed a very bad night—high fever this morning—dysenteric purging—skin burning hot and dry—tongue foul—pulse very quick—fixed pain about the umbilicus—tenesmus—calomel, grs. viij; pulv. ant. gr. ij; opii, gr. j; to be taken twice a day.

21*st*. All the symptoms worse to-day—skin clammy, with partial sweats—stools green, thin, small, and frequent—severe tenesmus—burning heat and pain at the stomach—omit the calomel—saline draughts with camphor through the day—anodyne antimonial at night.

22*d*. Passed a very restless night—severe purging of green, fœtid stuff—pain in the head and epigastric region excessive—skin intensely hot —pulse quick—thirst insatiable—great inquietude, never resting a minute in one position—had recourse again to the calomel, opium, and antimonial powder—but to be taken morning, noon, and night.—At 8 P. M. a little more composed.

23*d*. Passed a better night—this morning very restless and uneasy—all the symptoms as bad as

yesterday morning, with the addition of frequent delirium, and pain in the right side.—The same treatment as yesterday.

24th. Slept some last night—symptoms this morning rather more favourable—the internal burning heat in the epigastric region not so great—the extremities covered with cold, clammy sweats—the calomel bolus repeated three times, as usual, with camphor mixture every four hours.

25th. The dysenteric symptoms not so violent to-day—heat and pain in the epigastrium diminished—the pain of the right side subsiding—at noon, a violent paroxysm of fever, ushered in with rigors, which has left him in a very debilitated state—added decoction of bark and port wine to the mercurial treatment.

26th. Mouth sore—fever gone—bowels easy—asks for food—medicines continued as yesterday.

27th. Ptyalism—recovering fast—omit the mercury, and to have nourishing diet.

28th. Ptyalism continues—free from all complaint—returned on board of his ship.*

* This is also a very valuable case. It shews us the fever accompanied with dysenteric symptoms—and where the determination to the liver was quite evident.

If these honest and plain narratives do not remove every shadow of doubt, in regard to the efficacy of mercury in tropical fevers, all human testimony is vain. These documents

CASE VII.

JOS. HUGHES, MARINE.

Off Edam Island.

October 9th, 1800. Complained this morning of the usual symptoms of the Batavian fever—his head-ache exceedingly intense.—He had done duty on Onrust Island, where he slept, and often got intoxicated with arrac—an emetic, and after its operation, the anodyne antimonial draught.

10th. A very restless night—great pain in the forehead this morning—internal heat and pain at the pit of the stomach—tongue foul—bowels uneasy—pulse full and quick—frequent small, green, fœtid stools—ordered the emetic-cathartic solution, which operated well both ways—the anodyne antimonial as last night.

11th. At one o'clock this morning, he was seized with convulsive twitchings—difficult breath-

are more convincing than if they came from myself—for I might either be blinded by prejudice, or have some interest in distorting the truth. Neither of these can have operated here—for the practitioner evidently resorted to mercury with reluctance, and hardly ever, till other means were first tried. Lastly, I cannot deviate in the least from the letter of the original; for the gentleman who noted these cases is now in England (though perfectly unconscious of their coming before the public) and could instantly detect any misrepresentation.

ing—alternate flushes and rigors—rattling in his throat—insensibility—pulse small, quick, and irregular—sp. c. c. gt. xxx, aq. menthæ, ℥iß, æther vitriol, ʒß—this paroxysm lasted three hours, with momentary intermissions—at 8 this morning, more composed—skin hot and dry—tongue foul and furred—abdomen full and tense—natron vitr. ℥j—two copious, fœtid stools—evening, something better—perspires—the night draught as before.

12*th*. Slept till midnight—at 1 o'clock, stole out of bed, and leaped overboard; but was instantly picked up by a boat, that happened to be alongside.—He was now perfectly sensible, and somewhat frightened—could not account for his conduct—returned to bed—at nine this morning, tongue foul—skin warm and clammy—body has a disagreeable smell—camphor julep every two hours—at 1 P. M. became very restless—made several attempts to get overboard—(to walk in the garden, as he expresses it)—talks incoherently—at 4 P. M. worse—cold, profuse, clammy sweats—complains of no pain—when asked how he does? replies, "Very well."—pulse small and fluttering—lies on his back, in a state of stupor—mouth and eyes half open—can hardly be roused—the camphor julep continued, with an opiate at night. He drank a pint of madeira wine in the course of the day.

13*th*. No sleep last night—cold, clammy sweats to-day—made several attempts to get overboard—pulse small and quick—tongue covered with a brown crust—still answers that he is "very well"

(a dangerous symptom)—decoction of bark and port wine—his stomach retentive—opium and camphor at bedtime.

14*th*. Very restless in the latter part of the night—delirious—made several attempts to get overboard.—This morning, violent black vomiting, which was checked at 1 P. M. by opium, æther, and a blister to the epigastrium—great restlessness—constant desire to get overboard—skin cold and clammy—brain and mental functions still much disordered—craves for wine, which is given to him—at 4 P. M. more collected—begs to be sent to the hospital—his request complied with.—At 5 P. M. he got up, in good spirits—dressed himself—went into the boat, unassisted—when landed, he insisted on carrying his own hammock and bed up to the hospital, which he actually did—he there drank a glass of port wine, and went to bed—at eight in the evening he was in a sound sleep, with a fine warm moisture diffused over his skin, and every symptom favourable—at five in the morning, he was found dead in his bed—lying on his face, with nearly a gallon of red and yellow stuff, resembling blood and bile, under him, and which was still running from his mouth.—On shifting him, to have him buried, his whole body emitted the most intolerable effluvia. He must have died suddenly, and without a groan; as three nurses sat up in the ward, and thought him asleep all night.*

* This is a singular, though, I think, not inexplicable case. It furnishes at least one important reflection—namely,

CASE VIII.

ROBT. ALDRIDGE, MARINE, H. M. S. CENTURION.

Off Edam Island.

13th October, 1800. Was seized last night with fever, ushered in by cold rigors. At eight this morning, skin clammy—head giddy—pulse small and quick—tongue white and furred—bow-

---

how easily we may be deceived by the phantom *debility*. Forty-eight hours *before* this man carried his hammock to the hospital,—"he lay on his back, his eyes and mouth half open—his pulse small and fluttering." Was not the debility here apparent, not real? Were not his powers oppressed—not exhausted? Else how could two short days of subsequent fever and delirium give him the almost miraculous strength—"to rise, take up his bed, and walk?" It is quite inconsistent with observation, that this could have been one of those fatal calms preceding death, from mortification of an important organ. In such cases, although the patient fancies himself relieved, or even that he is strong, there is little real force. The sound sleep, and warm moisture on the skin, are very incompatible with actual mortification.

But if we advert to the state of the brain for several preceding days, we shall not hesitate to say, that effusion or rupture of vessels carried him off instantaneously.

The morning before, we see that he was seized with violent black vomiting, which was checked by medicine. The return of this, when he was in bed, after the preceding exertion, and a great determination for some time past to the brain, has caused sudden rupture or effusion, which induced immediate death, or apoplexy ending in the same. Finally, was it not this *apparent debility* which prevented the exhibition of cathartics and mercury, so successfully employed in the preceding case?

els uneasy, with pain about the umbilicus—a saline cathartic—after operation of the cathartic—camphor julep every two hours.

14*th*. Passed a tranquil night. At eight this morning, skin hot—severe pain in his head—stomach uneasy—an emetic of ipecacuan, which brought off much green bile—an anodyne antimonial at bedtime.

15*th*. At ten o'clock last night, a great exacerbation of fever, with delirium, which remitted at four this morning. At 8 A M. complains of debility and head-ache—skin soft and perspirable—bark decoction every two hours—at noon became delirious—skin hot and dry—at 6 P. M. high fever—head much affected—great incoherence—pulse full—tongue foul—bowels costive—omit the bark—a saline purgative procured three stools—the draught at bedtime, as before.

16*th*. Passed a restless night. At eight this morning, high fever—severe pain in the head and stomach—internal burning heat in the epigastrium—calomel, gr. viij; pulv. ant. gr. ij; opii, gr. j; ft. bolus, ter in die.*—At 2 P. M. skin moist and

* Too late. An active employment of mercury from the beginning, without any other aid than copious intestinal evacuations, would have had the patient now on the verge of ptyalism.

Let those who are disposed to cavil at some points of practice pursued here, particularly the exhibition of bark, and omission of venesection, point out from what sources the surgeon could have drawn a better *methodus medendi*. Certainly

warm—pain in the head and stomach—6, P. M. became very hot and restless—pain in the region of the stomach severe, with intense burning heat there, both internal and external—calomel, &c. continued.

17*th*. Was easy all night—passed two copious stools—skin was warm, with equally diffused moisture—at eight this morning, he is better—the pain has left his head and stomach—at 1 P. M. uneasiness in the region of the liver—*cannot bear the least pressure over it*—the calomel continued ter in die, as usual—at 3 P. M. stomach uneasy—black vomit, (resembling coffee grounds, exactly) —severe pain in the forehead—the effervescing draughts every two hours—added four grains of camphor to the evening dose of calomel.

18*th*. Restless night—*delirium*—*watery eyes*—skin changing yellow. This morning, complains of twitchings in the calves of his legs—collected and sensible when spoken to—calomel and

not from books; at least, not from the works of Bontius, Lind, Clark, or Balfour. Nay, at this day, venesection is condemned and bark extolled! Vide Hunter on the Diseases of Jamaica. And Dr. Bancroft, the latest writer on Yellow Fever, seems to rely principally on bark. Mr. Curtis, the last writer on the Diseases of India, boasts of having seldom "wet a lancet," except in specific inflammation.

If it be said, why did not *observation* point out the necessity of bleeding, and the injury occasioned by emetics and bark? I answer, by asking,—Why did not *observation* point these out long ago to those writers enumerated? Why did not Cullen find out the utility of purgatives in fever before Hamilton?

camphor as before—blisters to his legs—at noon, skin cold and clammy—profuse perspirations—tried the bark in various forms—but the very sight of it made him vomit—the calomel and camphor continued ter in die—at ten P. M. sensible to the pain of the blisters.

19th.—Slept a little last night—this morning, giddiness—skin of a bright yellow colour—took the bark, with much persuasion—at 11 A. M. it made him sick, hot, and restless—bowels uneasy—abdomen tense and full—glysters brought away several fœtid stools, and stuff like grounds of coffee—took xxxiii grains of calomel to-day, but no appeacance of its entering the system—skin of a deep yellow colour.

20th. Restless and delirious in the night—oozing of blood from nose and mouth, which tinged the linen yellow.* This morning, skin hot and dry—tongue brown—intolerance of light—head much affected—starts when spoken loudly to—says he is "very well," and seems much surprised at being asked the question—lies on his back, with mouth and eyes half open—pulse small and stringy—took xxxii grains of calomel to-day, with camphor julep.

21st. Symptoms as yesterday. In this state he continued for forty-eight hours, when the black vomit, with convulsions, carried him off, on the

* If this be not a case of "*Yellow Fever*," I know not what is.

23d October, the 10th day of his illness. Not the least symptom of ptyalism could be seen, though he took calomel to the last hour.—He had done duty on shore, both at Cuypers and Onrust, where he lived very intemperately.*

CASES IX & X.

SERJEANT COWARD AND MICH. CAMILER, R. MARINES, H. M. S. CENTURION.

Off Edam Island.

October 14*th*, 1800. They were both attacked with the Batavian fever yesterday, and with symptoms nearly the same as Aldridge's, described in the last case. The emetic solution was prescribed, and operated well both ways—at night, the anodyne antimonial draught.

15*th*. Symptoms nearly the same as Aldridge's; tried the bark in various forms, but they could not retain it a moment on their stomachs;—indeed the sight of it made them vomit—calomel, opium, and antimonial powder, as prescribed for Aldridge, was given three times a day, without any other medicine, till their mouths got well affected (27th October), when every bad symptom disappeared. They were both perfectly yellow before the mercury entered the system; but as ptyalism came on,

* Was there not effusion in the brain here, as well as derangement in the liver?

their skins assumed a more natural colour. They continued a long time in the convalescent list, before they acquired strength. They had done duty and slept on shore at Cuypers and Onrust islands, but never slept at Edam.

CASE XI.

MR. THOS. F. CARTER.

From Edam Hospital.

October 26*th*, 1800. Has been six days ill with the Batavian fever on Edam Island, and sent on board at six o'clock this evening, in hopes that change of air may mitigate the disease.

He now complains of coldness in the lower extremities—bad taste in his mouth a troublesome purging—great dejection of spirits—pain in his head and epigastric region—pulse small and quick—frequently delirious before he came on board—had taken bark in various forms at the hospital, without any benefit; on the contrary, he daily got worse.—The emetic-cathartic solution was given him this morning on shore, which is still operating—as he was much fatigued by coming on board, gave him a glass of port wine, and the camphor julep.

27*th*. He was delirious and sleepless all night—skin hot and dry—the solution continued to operate in the night both ways, and he passed several fœtid stools. At nine this morning, all the symptoms worse—talks in the most incoherent

language—tongue very foul—*pulse full and quick*—complains of great pain over the orbits and sinciput—pain and burning internal heat at the stomach—calomel, gr. viij; camphor, gr. iv; opii, gr. j; ter in die *—a blister inter scapulas.

28*th*. First part of the night restless—latter part quiet, and slept a few hours. At nine this morning, all the symptoms aggravated—delirium—*full, quick pulse*—pain over the orbits, and in the sinciput—right eye much inflamed—blister rose well—is sensible to the pain of it—same treatment as yesterday.

29*th*. Delirious all last night—talks incessantly this morning, in very incoherent language—says he feels as if he had two heads—his eyes cannot bear exposure to the light †—has frequent convulsive twitchings of the tendons—repeated the calomel this morning—he drank a little brandy and water, which he relished much—at 8 P. M. very restless—skin hot and dry—tongue foul—twitchings of the tendons—right eye much inflamed, and prominent—had one fœtid, bilious stool—when asked how he does? replies, "Very well;" and that nothing is the matter with him—

* This is the seventh day of the disease—greatly too late!

† There are evident symptoms of congestion, if not inflammation in the brain here. This oppressed state of the sensorium renders the absorbent system so torpid, that there is no chance of the mercury being taken into the constitution. Evacuations, under these circumstances, by relieving the brain, invariably accelerate ptyalism.

his mind constantly employed about the ship's duty and prize stores—his countenance singularly wild and sallow—omit the calomel—pediluvium—diaphoretic powders of camphor and nitre—diluents.

30th. Very restless all last night—with great difficulty could be kept in bed, preferring the cold deck—was highly delirious—right eye prominent, and much inflamed—complains of pain in the calves of the legs—blisters to his legs—gave him a brisk dose of calomel and jalap, which operated, and brought off two copious fœtid stools—at noon, he is much more composed*—complains of strangury from the blisters—semicupium and sp. æther. nitros. gave relief to this symptom—great deafness—clammy, profuse sweats—small, weak pulse—bark and claret—the calomel to be again renewed—at 6 P. M. his right eye still inflamed, red and prominent—pulse full—violent delirium subsided—℥ß *bark, and a pint of claret, since morning*, which his stomach retains.†

* Although evacuations always gave more or less relief in this fever, yet the idea of *debility*—that unlucky term—seems ever to have cramped their employment

† "The prejudices that formerly existed against the Peruvian bark, in fevers," says Dr. Hunter, "are no longer in "being." (query) "They were founded in *idle speculations*, "and originated with the learned, from whom they descended "to the great body of the people; but even with the *vulgar* "they are now extinct." Diseases of Jamaica, page 122. If Dr. H. really believed the above, so late as June, 1808, when he dates his preface to the last edition, his information is not very extensive. At page 98, we have this remark—"In almost every case where the disease is *violent*, and the

Endemic of Batavia.

31st. Very restless all night, with *raging high delirium*—great difficulty in confining him to his bed—tongue and lips brown and crusted—stomach tense, with burning internal heat in the epigastrium—right eye red and prominent—at one o'clock this morning, a blister renewed to the back of his head—the calomel and jalap repeated; at six this morning no better—right eye inflamed, prominent, and seems *starting out of his head*, with other symptoms of a highly deranged state of the brain—*neither the blister nor purgative has taken any effect**—two large yellow blotches have appeared on his neck—I am forced to keep him

---

" patient much reduced, it (wine) is highly grateful and cor-" dial. It is of the utmost consequence, in giving both nou-" rishment and wine, that they be repeated often." Dr. H. recommends about a pint a day, in small quantities at a time, and the same of food. Who can blame the surgeon for pursuing a plan recommended by such authority? And, as I observed before, where has he any better instructions in fevers of the East?—Vide Bontius, Lind, Clark, Balfour, Curtis.

" On entering one of the wards at Haslar," says Dr. Trotter, " one of the Raisonable's people was *sitting up in bed*, with five guineas in his hand, and begged me, with great earnestness, to allow the nurse to lay the whole of it out for wine. This man had a *wavering* about him at the time, but which was always mitigated after his *dose*. The natural craving for this *cordial* induced me to increase his allowance to *four pints in the twenty-four hours*; it was almost the only case where my prescription exceeded *three pounds*. He had been a week ill in his ship. There was a *wildness in his looks*, not to be described; but it always denoted danger. *He died three days afterwards*, and took his medicine (wine lb. iv. daily) till within an hour of his dissolution." *Medicina Nautica, vol.* 1, *p.* 289.

O tempora! O mores!

* The torpor alluded to is here manifest—and there can be little doubt of its dependance on oppressed sensorium.

lashed down in his bed, as he made several attempts to get overboard—tore the blisters from his head—constantly grasping at every object—great deafness—no recollection of any person—his mind still employed about his accounts, and the ship's duty—strong convulsive spasms of the whole body; so that it often requires two men, with all their strength, to keep him down*—the raging high delirium sunk hourly, till, a few hours before death, when we could hardly hear him articulate—he was carried off with hiccup and convulsions next night, his body very little reduced, and without the least disagreeable smell.

Previously to the attack of fever, he was constantly employed on shore at the island of Edam, where he had charge of the prize-stores, and where he frequently exposed himself to the intense heat of the sun by day, and the noxious influence of the air by night—he used to sleep at the hospital—he died on the 11th day of his illness, six days after he came on board.

* With the strength of two men the day before death—his body unreduced—and where mad delirium, and eyes starting from their sockets, declared the state of the brain, I should have been tempted to bleed *usque ad deliquium*, or the relief of the symptoms, couta qu'il coute.

CASE XII.

MR. HAMMOND, CAPTAIN'S CLERK.

Off Edam.

October 23d, 1800. Was in the habit of being much on shore at Edam Island during the day; but never passed a whole night there—seized last evening with the usual symptoms of the Batavian fever—head much affected—great pain over the orbits—took the emetic-cathartic solution, which operated well—at night the anodyne antimonial.

24th. Passed a restless night—his bowels very uneasy—this morning he is very ill—all the symptoms violent—small, hot, bilious stools—the solution as yesterday, which operated both ways—at night the draught repeated.

25th. Passed a very bad night, with violent pain in the head and epigastric region—hot, dry skin—quick pulse—great inquietude of the system at large—could not rest a moment in one position—foul tongue. This morning, all the symptoms the same as during the night—calomel, gr. viij; pulv. ant. gr. ij; opii, gr. j; three times a day.* At 8 P. M. he appears a little more composed.

* This is the fourth day of the disease, counting the evening of the 22d as one.

26th. Had a violent paroxysm of fever in the night, ushered in with cold rigors. This morning, he is very poorly indeed—distressing bilious purging—countenance sallow and anxious—all symptoms appear exceedingly unfavourable—continue the same treatment.

27th. Passed a bad night—no alteration for the better—head-ache intense—pain in the epigastric region—hot, dry skin—pulse quick—dysenteric purging—medicine continued.

28th. No alteration.—had a violent exacerbation of fever to-day, ushered in, as before, with rigors—continued the same treatment—no appearance of ptyalism.

29th. Mouth sore.—All the symptoms alleviated—head-ache, and pain in the epigastric region, diminished—bowels easier—calomel bolus twice a day only.

30th. Mouth sorer—all the bad symptoms disappearing—complains only of debility—decoction of bark and wine.

31st. Mouth very sore—spits copiously—keen appetite—omit the calomel—put him on the convalescent list, with wine, and nourishing diet—from this time he recovered rapidly.—This case was treated entirely with mercury.*

* It would be difficult to conceive how a more unequivocal proof of the efficacy of any medicine could be given, than

CASE XIII.

PATRICK RYAN, SEAMAN.

Off Edam.

October 28th, 1800. This morning seized with the usual symptoms of Batavian fever—head-ache—pain and heat in the epigastrium—hot skin—quick pulse—emetic-cathartic solution, which operated well—in the evening a remission—anodyne antimonial.

29th. Restless night—complains much of his head and stomach—skin hot—lower extremities cold and clammy—effervescing draughts—at night, anodyne antimonial.

30th. Restless night—bilious vomiting to-day; pain and burning heat at the stomach—bilious purging—small, quick pulse—bark mixture, with lime-juice and mint-water—evening, the vomiting checked.

31st. Bad night, with delirium—more composed to-day—bark continued, with six gr. calomel, and one gr. opium, night and morning.

---

is afforded in this case. I had set it down as lost, till I saw the words "*sore mouth*," on the 29th, which dispelled my fears; for well do I know, from personal feeling, what *ease* this *soreness* brings.

November 1st. Slept all night. Passed some fœtid stools this morning—delirium—great inquietude—skin hot—eyes wild—same treatment.

2d. No alteration—pulv. rhæi, in addition to the treatment of yesterday, which procured some bilious stools.

3d. Restless night—sensible this morning—surprised to find his legs covered with scorbutic ulcers—omit the calomel on this account.*—prescribed the bark in decoction, with port wine and porter as much as the stomach could bear.

4th. Much purged all night—great delirium—this morning, very ill—skin cold and clammy—when asked how he does? replies, "very well," surprised at the question—bark makes him vomit; relishes porter only—at 6 P. M. sinks fast—body has a fœtid smell—skin changed yellow—knows no one—ulcers on his legs in a dreadful state—æther. laudan. aq. menthæ—porter ad libitum.

5th. No sleep last night—this morning, the black vomit—skin a deep yellow—insensible—

* Although a scorbutic diathesis must be unfavourable to the exhibition of mercury, yet an unreasonable dread of this medicine has gone abroad in such cases. To my knowledge, mercury has been pushed the length of ptyalism, for the cure of dysentery, where the hams were contracted, the ankles livid, and the gums spongy with scurvy; and no bad consequences ensued. Mr. Thomson, in the Lancaster, off the Isle of France, October 1804, witnessed this in many instances.—In fever or dysentery, I should not hesitate to use mercury, combined with opium, regardless of a scorbutic taint.

lies on his back, mouth and eyes half open—body smells intolerably fœtid—black vomit continues —at 10 P. M. died.

This is the only person who *died* of the Batavian malignant fever, *who had not slept on shore* at Onrust, Cuypers, or Edam. Long, previously to his illness, he was of a diseased, scorbutic habit—dirty, indolent, and desponding in his character.

CASE XIV.

MR. POWEL, MASTER'S MATE.

At Edam.

November 13th, 1800. Was attacked with fever yesterday, on shore, at the island of Edam, where he has resided, in charge of the prize stores, since the death of Mr. Carter. This morning, complains of the usual symptoms—pain and giddiness of the head—hot skin—cold extremities—quick pulse—the emetic-cathartic solution; after the operation of which—the anodyne antimonial.

14*th.* Restless night—was much purged—cold sweats—burning, acrid heat at the pyloris—pain over the orbits—six gr. of calomel, and one of opium, thrice a day—also the camphor julep every three hours—port wine or porter, as much as he can take—cold ablution—at 6 P. M. symptoms nearly the same—had many fœtid, bilious stools, during the day—spirits greatly dejected—

cold sweats on the extremities—pulse small, quick, and fluttering—tongue brown and crusted—great apprehension of death—bark.

15*th*. No rest all night. This morning, all the symptoms worse.—at 10 A. M. the fatal black vomit has appeared—cold sweats—delirium—omit the bark, which will not lie on his stomach; repeat the calomel—æther and laud. draughts every two hours—evening, the vomiting checked a little—blisters to the head and stomach—skin begins to change yellow—breath becomes fœtid—every symptom unfavourable.

16*th*. No sleep last night—worse in every respect this morning—he sinks hourly—low delirium—muttering—lips and teeth encrusted black—breath fœtid—insensible—lies on his back, mouth and eyes half open—skin intensely yellow—pulse small and fluttering—same treatment.

17*th*. Black vomit all night—cold sweats this morning—tongue black—pulse fluttering—singultus—eyes glassy—breath very fœtid—stools involuntary, and black, like coffee grounds—lies on his back, eyes and mouth half open—carried off, in an attempt to vomit.*

* Will any one assert, after reading this, and many other cases here, that the "*Yellow Fever*" never appears in the East?

CASE XV.

MR. WM. ROWARTH, ASSISTANT-SURGEON.

From Edam.

November 16th, 1800. He was employed on duty, at the hospital on Edam Island, where he slept. He returned from the island on the 12th instant, and was this day seized with the Batavian fever. It was ushered in with rigors, giddiness and vomiting, which lasted three hours; a hot fit then came on, which terminated in cold sweats.—The emetic-cathartic solution was taken at the commencement of the attack, and operated both ways—the anodyne antimonial draught at bedtime.

17*th*. Slept none during the night—had severe vomiting. This morning, profuse cold sweats—pain over the orbits and in the epigastrium—breathing short and laborious—great despondency, and dread of dying—effervescing draughts every two hours—drink acidulated—at 8 P. M. skin intensely hot—thirst insatiable—pulse quick and hard—tongue brown and crusted—vitriolic æther draught, with one grain solid opium.

18*th*. Slept a few hours in the night. This morning, some remission of the fever—the decoction of bark every two hours, which his stomach retains—at 8 P. M. quiet and rational—

pain has left his head—calomel, gr. viij; opii, gr. j; hora somni—bark continued.

19*th.* Symptoms as yesterday—promises a favourable result—bark and calomel as yesterday—At 1 P. M. took some fowl-broth, which he relished—his tongue, however, is still brown; at 10 P. M. he becomes restless—cannot lie any time in one position.

20*th.* Had a severe paroxysm of fever last night, ushered in with rigors and vomiting. This morning he is delirious—pulse quick and small—he lies on his back, with mouth and eyes half open—can with difficulty be roused—extremities covered with cold sweats—heat at the epigastrium—eyes glassy—deafness—skin changes yellow—breath becomes fœtid—at 8 A. M. took jalap, ʒj; calomel, gr. viij; ft. bolus.—At 1 P. M. several fœtid stools from the bolus, whose smell was insufferable—prescribed the bark, with port wine—in the evening, the body sponged with vinegar and water—has taken a pint of wine, and six drams of bark, in the course of the day.

21*st.* Symptoms nearly the same as yesterday—he lies in the same state, fœces and urine passing involuntarily—retains the wine and likewise porter on his stomach—bark and wine continued—has no recollection of any person—at 6 P. M. tongue encrusted—breath very fœtid; delirium—talks much—subsultus tendinum—head blistered in the evening.

22*d.* Slept a few hours last night—symptoms better this morning—no vomiting—more sensible—some appetite—ate some sago and wine—bark and wine, with porter, continued—at six in the evening becomes restless—all the symptoms exacerbated—black vomit—stools involuntary—skin a deep dirty yellow—fœtid smell from the body.

23*d.* All the symptoms worse, if possible—black vomit incessant—keeps nothing on his stomach—lies on his back, eyes and mouth half open—insensible—hiccup—cold sweats—tongue lips and throat black—death.

N. B. His wife went to sea with him—she too had been on Edam, and caught the fever there. She died with nearly the same symptoms as those of her husband.

CASE XVI.

FREDERIC CROMPTON, MARINE.

At Sea.

November 14*th*, 1800. Was sent on board last evening from Edam, slightly indisposed—this morning, complains of the usual symptoms of Batavian fever; which was, in this case, ushered in with cold rigors—the emetic-cathartic solution, which operated—the anodyne antimonial at night.

15*th*. Passed a restless night. This morning, skin hot—stomach irritable—ipecac. gr. xii—operated both ways—at night, aq. menthæ ℥ij, æther vit. ʒj—twenty drops of the nitrous acid every three hours, in rice-water.

16*th*. Bad night—head and stomach painful this morning—tongue white and furred—the acid through the day—æther draught at night.

17*th*. Nearly as yesterday—same treatment—keeps the acid on his stomach—nauseates the sight of bark.

18*th*. Restless night. This morning, skin intensely hot—small bilious stools—head-ache—calomel, gr. viij; pulv. ant. gr. ij; opii, gr. j; ft. bolus, mane sumend.—in the evening, a dose of magnes. vit.—operated well—more composed—æther draught at night.

19*th*. Restless night—skin intensely hot this morning—thirst insatiable—severe pain over the orbits—tongue foul—calomel, gr. x; rhubarb, ʒß—several bilious, fœtid stools in the evening—at night easier—pediluvium—blisters—draught.

20*th*. Very ill this morning—stomach irritable—fever high—tongue foul—head-ache severe—all other symptoms unfavourable—skin changes yellow—effervescing draught every two hours—a pill of opium and antimony at night—nitrous acid, diluted for drink.

21*st*. No sleep last night—vomiting incessant—bowels uneasy. This morning, no better—fever high—stomach irritable—skin yellow; bilious, fœtid purging—burning heat in the epigastrium—head giddy—pulse small and irregular—every symptom unfavourable—in the evening no better—same treatment as yesterday, with nitre and camphor powders at night, also calomel, grs. viij, which produced a diaphoresis.

22*d*. Passed a more quiet night—seems better this morning—an apparent remission of the fever—stomach not near so irritable—calomel, pulv. ant. et opii, ter in die.

23*d*. He is still better to-day—stomach quite easy and retentive—ate some fowl-broth, and drank a glass of wine—I have added the bark to the calomel and antimonial powder—It sits on his stomach—at 8 P. M. becomes restless—frequent vomiting of black, fœtid bile—the bark has done harm—omitted it, and continued the calomel.

24*th*. Restless all night. This morning, all the symptoms are worse—stupor—not sensible when spoken too—great heat at the epigastrium—general inquietude throughout the system at large—pulse irregular—as the evening approached, an exacerbation—omit all medicines except opium and æther, as the stomach will retain nothing.

25*th*. Thirst insatiable—great debility—

bowels uneasy—more sensible than he was last night—at noon, black vomit—skin a bright yellow—cold sweats—hiccup—subsultus tendinum—ate some fowl-broth with a relish—at night, black vomit incessant—opium and æther.

26*th*. Black vomit all night—eyes glassy—skin a dirty deep yellow—convulsive hiccup—death.

He had lived very intemperately at Edam.

The foregoing cases, selected out of an immense number, will be sufficient to convey a very accurate idea of this endemic, and to support the remarks and general description which preceded them. I have exhibited more fatal than favourable terminations; as the former must include the whole range of symptoms, from health to death, and ascertain the inefficacy of measures in which we might be apt to place too much confidence.

It certainly will not be denied, that this is a very interesting and valuable document, as it gives us a much clearer view of the Batavian fever, than any English work in ordinary circulation; accompanied with numerous collateral incidents and observations, that excite reflection, while they strongly rivet our attention.

I shall glance hastily at some prominent traits in the character of this fever, with a few remarks on its cause, leaving the reader to form his own conclusions.

In the first place, the great similitude which it bears, in most of its leading features, to the endemic of the West, cannot have passed unnoticed. Independently of the yellow skin and black vomit, they coincide in many minor, but characteristic symptoms; for instance, the mental despondency, amounting to timidity, at the beginning, veering round to non-chalance or apathy, in the progress of the disease.

That fatal lull, and occasional sensation of hunger too, which are so apt to deceive the inexperienced in the Western endemic, frequently appeared in that of the East. Neither would it seem very difficult to account for their discrepancies. For whether we allow that these endemics are solely caused by the local miasmata, or are the bilious remittents of hot climates, aggravated by these invisible agents; still, in either case, as the cause, or combination of causes, must vary according to the nature of the climate and soil, so we cannot expect to have their effects agreeing in every minute particular. Nevertheless, as the operation of these causes on the human frame appears to be nearly the same in all climates, we can clearly discern (in the broad outline of their effects) a strong family likeness through the whole ghastly tribe.

"————facies non omnibus una
Nec diversa tamen.————"

The opinion that these grand endemics (yellow fever, for instance) are only the bilious remittents of all tropical climates, in a more concentrated state or degree, is founded, I fear, either on superficial observation, or too great a rage for generalising. The bilious remittent may take place an hundred leagues at sea, in consequence of atmospherical vicissitudes acting on particular organs, whose functions were previously disturbed by atmospherical heat. The endemic, on the other hand, is produced by a specific miasm, (witness that of the fatal island Edam) which, independently of all those peculiar states of the air, or the body, requisite for the production of bilious remittent, will, when in a condensed form, kindle up, at any season, and in any constitution, a fever of terrible malignity.

These diseases then, may be often—perhaps generally combined; since their causes acquire force and subside, *pari passu*, and at the same period of the year. But assuredly they are sometimes totally distinct, and quite unconnected with each other.

This reasoning is corroborated by the fact, that time, (for instance, eighteen months or two years in the West-Indies) will accustom the human frame to the action of the febrific miasm, and thereby secure it, generally speaking, from the endemic; but no number of years is a protection from the bilious remittent. Now, if the two fevers differ only in degree, is it not natural to expect that the seasoning would more certainly insure us an immunity from the less than

the greater degree of the endemic? But the reverse is the case.*

The circumstance of the Dutch officers and Malays falling victims at Edam, might seem to militate against this doctrine; but the objection vanishes, when we recollect, that by previously residing in the country, entirely out of the sphere of the local effluvium, they were in reality no more seasoned to it than the English; and the mortality in the garrison proved it. They were in the same situation as the native or veteran West-Indian, who, by spending a few years in Europe, loses his protection against a visitation of yellow fever on his return.

Neither will residence in one tropical climate

---

* His Majesty's ship Amelia arrived on the West India station, in July 1804. In October following, while cruising off the coast of Surinam, the yellow fever broke out; and during the three days preceding her arrival in Carlisle Bay, viz. 14th, 15th, and 16th October, she buried the surgeon and ten men. On the 17th, the day she anchored, the captain (Lord Proby) and several men died; and in the course of the next six weeks, the fever went through the whole ship's company, of whom thirty-one died at the hospital.

The fever raged with equal violence on shore at Barbadoes, among those troops who had been *from Europe lately*, viz. the royal artillery corps, and 1st regiment of foot. In the family of General Myers, lately from Europe, thirteen out of fifteen died. All this time, however, the *seasoned* troops, and the prisoners of war, were perfectly healthy, or only slightly affected with common bilious remittents.

So, in October, 1808, in ten days after the arrival of the Pompée at Carlisle Bay from England, the yellow fever was general on board, and ran nearly through the ship's company; while all the other ships of the squadron, which had been *more than a year* on the station, were healthy, or had only a few cases of bilious remittent fever.

Q

prove any security against the local endemic of another, as the above circumstances themselves render evident. Thus the crew of a ship, that has been two or three years on the Coast of Guinea, and sails direct from Sierra Leone to Barbadoes, which are nearly in the same parallel of latitude, will be as liable to yellow fever, as if they had sailed from England; while a two years' station in the West Indies would have almost insured a subsequent exemption.

Indeed, the plan of seasoning troops against *yellow fever*, by stationing them for some time previously, at Gibraltar, Madeira, or in the Mediterranean, has completely failed; and how could it be otherwise, if the Coast of Guinea itself is no protection? a melancholy proof of which was exhibited in H. M. S. Arab, in 1807; which ship came from the latter place (where she had been nearly two years) to the West Indies, and suffered dreadfully by the yellow fever.

These facts (particularly the last) must go far to dissolve the theory of the ingenious Dr. Bancroft, who has laboured to prove, that "the security from the disease (yellow fever) is principally derived from the *ability to endure great heat*." Essay on Yellow Fever, page 265. The dangerous consequences which might obviously result from trusting to such a protection, as well as Dr. B.'s candour and humanity, will induce him to re-consider the subject. The officers and crew of the Arab, on their arrival in Carlisle Bay, considered themselves perfectly seasoned and secure; but on putting to sea, in the course of a month, the endemic broke out with such

violence, that in one week they lost thirty-four men, and were forced to put into Antigua, in the greatest distress.

Dr. Bancroft, indeed, is not singular in his opinion, which appears to be copied from Dr. Trotter [Medicina Nautica, vol. 1, page 336] who has *theorised* widely on a foundation which the foregoing *facts* completely overturn. Dr. T. probably took the doctrine from Dr. Moseley, who tells us, that a seasoning at *Bermudas* will secure us from the yellow fever of the *West Indies.* p. 65. "Let no such plan be trusted."

The locality and range of this febrific miasma, are clearly decided by the Dædalus. Her ship's company breathed the same general atmosphere as the other crews, for months together; but, with the exception of the purser and surgeon, no man belonging to her came within the fatal circle (in the night, at least) though seldom more than *two* or three miles from its centre. The officers abovementioned exclusively felt its influence, and, like too many others, fell victims to its direful force.

This document furnishes decisive evidence on two points of great practical importance. One is, that even within the limited range of this poison, its power is nearly inert, comparatively speaking, during the day; the other, that when nocturnal exposure has given rise to the disease, it is non-contagious. It is obvious what an influence the certain knowledge of these circumstances must have on our conduct, and to what useful purposes we may apply it.

In this, as in all other violent endemics, the head and epigastric region were, as usual, the

foci of the disease. The inutility, or rather the injury of every other medicine, than mercury and purgatives, was abundantly manifested. But with all due deference and respect for the surgeon, and a proper allowance for the embarrassing situation in which he was placed, I conceive that the first remedy was not applied early enough, or with sufficient boldness; and that the purgatives, through a false fear of debility, were not so frequently administered, as their evident utility warranted.

In the solitary instance where venesection had a trial, the hasty conclusion which was thence formed of its pernicious effects, in consequence of the sudden death and putrescency of the patient, deserves a remark. If the reader will revert to Joseph Hughes, (Case VII) who, after dressing himself in good spirits—going into the boat without assistance—carrying his hammock up to the hospital—retiring to bed, and falling into a sound sleep, was nevertheless found dead in the morning, "his body emitting the most intolerable effluvia;" he will probably agree with me, that had this man been bled on entering the hospital, his death might have been attributed to venesection, with as much *apparent* justice, as any *single* incident could support.

This may serve as a lesson to us, how wary we should be in rejecting entirely a powerful remedy, from solitary or even several failures. For how difficult is it, in such cases, to say with certainty—such is the successful, and such the unsuccessful medicine! The prejudice against bleeding (seemingly justified by this event) was engendered too, by "accounts which had been

read of its bad effects in fevers of the West Indies;"—fevers in which its pre-eminent service is now ascertained beyond a shadow of doubt.* From all these considerations, and from an attentive examination of the symptoms themselves, we may conclude, that venesection deserves a much further and fairer trial in this fever; and I entertain little doubt, that it will be found a powerful auxiliary to the other means of cure.

Of the efficacy of mercury, under all its disadvantages, I need say little. There is the decision of the surgeon himself, who treated nearly 200 cases of the fever—there are specimens of these cases detailed—and there is a strong proof of the dependence placed in this remedy, where we find the surgeon himself confide his own life to its power, when attacked by the fatal fever of Edam. I would, however, recommend it to be used in the early and liberal manner pointed out in the Bengal endemic, with the same attention to intestinal evacuations. The ptyalism should be copious, and more or less of it kept up till strength be completely restored. The cold af-

* What will the reader think of the following passage in a modern publication?—"In such cases as seemed most to require it; (blood-letting) for example, where the patient was young, strong, of a full habit, and lately arrived from Europe; where the pulse was quick and full, the face flushed, with great heat and head-ache; and all these at the beginning of the fever, *bleeding did no good.*" Hunter on the Diseases of Jamaica, 3d edition, page 118. Here is a guide for the young practitioner on entering the tropics!! Compare this with the result of nearly six years' extensive experience in yellow fever, as detailed in the next section.

fusion bids fair, during re-action; and, at all events, cold applications to the head, with pediluvium, will invariably prove serviceable.

The opinion of Dr. Cullen, that the influence of the remote cause ceases when the fever is once formed, is here proved to be not only erroneous, but dangerous. Removal from the sphere of its action, during fever, invariably protracted the fatal catastrophe; and could the patients have been transported quickly into a pure air, while ptyalism went on, they would, in all human probability, have survived, as the surgeon himself believed. Vide Case V.

One remarkable incident remains to be noticed, and cannot have eluded the observation of the reader. I mean the circumstance of the four *mercurial* patients, who resisted the baleful influence of Edam. Such an immunity cannot be attributed to chance. The proofs are both positive and negative. *They, and they only, escaped the fever.* It accords with my own experience; for never have I known a person fairly under the influence of mercury, for the cure of any other complaint, to be attacked either by endemic or contagious fever. I have seen several, who were reduced by long courses of mercury previously, and who had left it off, fall victims to fever and flux; but never during the exhibition of the medicine. So confident am I of this, that were I in a state of ptyalism, I should not fear to sleep on Edam to-night. I should take good care, however, to keep my mouth sore, till I got to a very respectful distance from the fatal spot. We know that a slight, or even a free ptyalism, may be kept up

for weeks together, without any serious injury to health; and if such a state proved a certain antidote (as it did here without doubt) against the most powerful cause of fever that ever, perhaps, had "a local habitation, or a name," the inconvenience of the prophylactic is very trifling, compared with the security it affords. The rationale of the preservative is simple and obvious. If it cure the disease, why not prevent it? Bark was formerly considered capable of both—(witness the peruvian drams that used to be served out to wood-cutters in hot climates); fatal experience has proved it equal to neither! Mercury, by keeping up the action of the extreme vessels on the surface, and in the hepatic system, prevents, what I conceive to be the paramount effects resulting from the application of febrific miasmata—INEQUILIBRIUM IN THE BALANCE OF THE CIRCULATION, AND CONGESTION OR INFLAMMATION IN ONE OR MORE OF THE INTERNAL ORGANS.

ENDEMIC OF THE WEST;

VULGO,

YELLOW FEVER.

Sec. 5.—The following concise, but animated description of the fatal Western endemic, is written by a physician of first-rate talents, lately returned from the West Indies, and now filling an important station in this country. As he had the charge of a public hospital nearly six years in that climate, with the most extensive field for observation, this document will be found highly valuable and interesting.

Although the gentleman's name would add dignity to this publication, I shall at present allow the intrinsic merit of the communication itself, to be its own passport and recommendation; merely observing, that it probably contains *more* useful and practical information on the subject of Yellow Fever, than some modern octavos of the most ample dimensions.

The endemic fever, commonly called the Yellow Fever, certainly excites the first interest, both on account of the mortality which attends

it, and the discrepancy among professional men respecting its nature and treatment. The inhabitants of this island, as well as the other West India islands, are subject to various fevers of the typhoid, catarrhal, or remittent kind. These attack indiscriminately the native or the seasoned European, and are as mild as fevers of a similar type in Europe. But the fatal fever, of which I am about to give some account, for the most part attacks persons from Europe, within the first *year and a half* after their arrival in the country, and more particularly seamen and soldiers.

It generally appears at a certain period of the year, earlier or later, milder or more aggravated, according to the state of the weather during that season. Solitary instances, however, occur at all seasons of the year, when favoured by predisposition, assisted by strong exciting causes. The natives are not entirely exempt, but to them it rarely proves fatal.

This fever is usually ushered in by the sensations which precede other fevers; such as lassitude, stiffness, and pain of the back, loins, and extremities; generally accompanied by some degree of coldness. These are soon succeeded by a severe pain of the head; a sense of fullness of the eye-balls; intolerance of light; skin dry, and imparting a burning heat to the hand; pulse full and quick; tongue covered with a whitish mucus, but often not materially altered from the state of health; bowels bound.

If the patient has been attacked in the night, he awakes with oppressive heat, head-ache,

and the other symptoms of fever, the sensation of cold having passed unnoticed. At other times, after fatiguing exercise in the sun, and sometimes after a hearty meal, the violent head-ache, and other symptoms of the fever, are ushered in by an instant loss of muscular power, and immediate depression of nervous energy. The patient, as if he were stunned by a blow, falls down, his eyes swimming in tears. In those cases, delirium is an early symptom. In a few hours, the pain of the loins increases, and in aggravated cases, stretches forward towards the umbilicus; the countenance is flushed; the white of the eye as if finely injected by blood vessels, the albuginea appearing through the interstices of the network of vessels, of a peculiar blue, shining, cartilaginous whiteness.

During the first twelve hours, the patient is not particularly restless, enjoys some sleep, and, when covered by the bed-clothes, has partial perspirations on his face, neck, and breast.

About the end of the first twelve hours, there is a great exacerbation of the fever; he becomes restless; the heat and dryness of the skin increase; there is much pain of the eyes and frontal sinuses; the pain of the thighs and legs is augmented; thirst is increased, with a sensation of pressure about the region of the stomach. Nausea and vomiting occur towards the end of the first twenty-four hours. If the fever has not been arrested within thirty-six hours from its commencement, the patient is in imminent danger, and all the symptoms are aggravated; the pulse is strong and full, and pulsation of the

carotids appears distinct on each side of the neck. The skin continues hot and dry; the thirst is increased; there is much anxiety, the patient continually shifting his posture; the urine becomes high coloured; all his uneasiness is referred to his head and loins. A sensation of pain is felt about the umbilicus, when pressed upon; the white of the eye now appears of a dirty concentrated yellow colour, and apparently thickened, so as to form a ring round the margin of the cornea. The blood vessels of the eye appear more enlarged and tortuous; knees drawn upwards to the abdomen; frequent vomiting, with much straining; mucus, and his common drink only, being ejected. Delirium comes on about the end of the second day. There is now a dryness, or slight sensation of soreness of the throat when swallowing; and about this time, an urgent sensation of hunger comes on, and a remarkable want of power in the lower extremities, resembling partial paralysis of the limbs. About this time, also, the pain of the loins is so severe, that the patient expresses himself as if his "back was broken."

The third day, or stage, begins by an apparent amelioration of all the bad symptoms, the vomiting and thirst excepted. The matter ejected has small, membranaceous-looking flocculi floating in it, resembling the crust washed from a port-wine bottle. The thirst is now urgent, and there is an incessant demand for cold water, which is almost immediately rejected by the stomach. The heat of the skin is reduced:

the pulse sinks to, or below its natural standard; the patient, for an hour or two, expresses himself to be greatly relieved, and at this time, a person unacquainted with the nature of the disease would have hopes of his recovery. This state, however, is of short duration, and the delusion soon vanishes.—The delirium increases; the matter ejected from the stomach becomes black as coffee-grounds, and is somewhat viscid. Diarrhœa comes on; first green, then black, like the matter vomited. The patient often complains of being unable to pass his stools, from a want of power in the abdominal muscles. There is an acrid, burning sensation of the stomach, and soreness of the throat, extending along the whole course of the œsophagus, in attempting to swallow; eyes, as if suffused with blood; skin a dirty yellow; parts round the neck, and places pressed upon in bed, of a livid colour. Hemorrhage, more or less, takes place from the nose, mouth, and anus, and a deposition of blood from the urine. The delirium becomes violent; the body as if it were writhed with pain, the knees incessantly drawn up to the belly. The patient seizes, with convulsive grasp, his cradle, or any thing within his reach, and prefers the hard floor to his bed. The pulse now sinks; respiration becomes laborious; the countenance collapsed—the lustre of the eye gone.—For some hours, he lies in a state of insensibility before death; at other times, expires after some convulsive exertion, or ineffectual effort to vomit. The tongue, during the whole course of the fever, is but little altered; and if loaded

in the early stages, is clean and florid before death.*

Such is the regular succession of symptoms which characterize this fever, but of longer or shorter duration, according to the violence of the disease, or strength of the powers of life to resist it.

In weakly habits, the vascular action at the beginning is less marked; and in these cases, the fever is generally more protracted, and the patient expires unaffected by the laborious respiration, and convulsive motions, which attend the last struggles of life, in the more violent degrees of this endemic. Very often the patient retains his senses till within a few minutes of his death; and sometimes will predict, with considerable precision, the hour of his dissolution.

In the early stages of the worst cases of this fever, there is much anxiety in the countenance of the patient, who expresses a despair of recovery. This fear does not appear to proceed from any *natural* timidity, but seems rather a symptom of the disease. In the last stage, there is as much *resignation* to his fate, as there was apprehension at the beginning. The fever of the Amelia in 1804, and of the Northumberland and Atlas in 1805, terminated fatally from the second to the fourth day. The fevers of 1807 and 1808, extended from the third day to the fifth. I have never noticed a remission during

* This confirms the observation of Dr. Blane, that in yellow fever, "the tongue is somewhat white and foul, but I do not remember to have seen it black and dry." 3d edit, page 413.

the whole course of the fever. Several cases of remittent fever under my care terminated in the endemic fever.

A certain number of those attacked by this fever, if prompt measures to subdue it had been employed, recovered from its first stage. They exhibited evident signs of amendment within the first twenty-four, or at farthest thirty-six hours, from its first attack. Also, a considerable proportion recovered from the second stage; that is to say, previously to black vomiting unequivocally appearing. But I have only known thirteen cases, in above five years, to have recovered from the last stage. Some of these were afterwards invalided, in consequence of dyspeptic complaints, and generally disordered state of the stomach, and other abdominal viscera.

In these cases, the stomach gradually became retentive; the eyes and skin became of a more vivid yellow; they had refreshing sleeps, but continued extremely weak and languid for a long time. The oozing of blood from the fauces and gums also continued for some days; and the deposition of blood in the urine remained longest; this excretion being always the last to return to its natural healthy condition.

Pain of the back, early stretching round to the navel—soreness in the throat and œsophagus—heat and acrid sensation in the stomach—urgent thirst—hunger—want of power, resembling paralysis of the limbs—violent delirium—despondency—enlargement of the blood vessels, and red-yellow colour of the white of the eye, either singly or collectively, indicate extreme

danger; and when the black vomit has appeared, scarcely a hope remains!

The following were the appearances after death [four cases excepted] in above an hundred bodies which I have inspected.

Omentum a little altered.—Peritoneal coat of the stomach occasionally marked, in a slight degree, by inflammation.—The stomach contained more or less of a viscid, black fluid, such as was ejected by vomiting.—Irregular spots, patches, and streaks of the internal surface of the stomach, in a state of inflammation, gangrene, or sphacelus.—Sometimes large portions of the villous coat destroyed, as if *corroded by some acrid matter.*—The small intestines and cœcum inflated with air, and often containing lumbrici, and a small quantity of dark coloured fœces, were inflamed, and in many places approaching to the state of gangrene.—No marks of inflammation in the colon, but it was singularly contracted.—Lower part of the rectum frequently excoriated—Concave surface of the liver inflamed.—Gall-bladder turgid with ropy bile; and, in some instances, its coats were one-fourth of an inch in thickness.—Other viscera of the abdomen little changed.—In the thorax, the posterior part of the superior lobules of the lungs, generally were very turgid with blood.—Internal surface of the œsophagus, throughout its whole extent inflamed.

In ten cases of a peculiarly aggravated degree of fever, where much delirium had been present, I opened the head. The blood vessels, in some instances, seemed more turgid with blood than usual. In two cases, there were about two

ounces of serum effused into the lateral ventricles; but in five cases the brain did not exhibit any marked appearance of disease.*

The black matter found in the stomach had not the most distant resemblance to bile; but evidently was blood poured into the stomach from the relaxed vessels, or excoriated and gangrenous surfaces, altered by the vitiated secretion of the gastric fluids.

Europeans, within the first eighteen months after their arrival in the country, being almost exclusively obnoxious to the yellow fever, it is natural to suppose, that there is something in the European constitution, favourable to the morbid motions which constitute this fever; and that this peculiar habit consists in a disposition to take on inflammatory action. Persons seasoned to the climate, and even natives, by sudden alterations in their mode of life, sometimes acquire this predisposition. Young people born in the West Indies, and educated in England; and persons having resided some years in England, after they had passed the greatest part of their lives between the tropics, are liable to this fever on their return to the West Indies.

This disposition is excited into action by a variety of causes; the chief of which are—intemperance; excessive fatigue in the sun; perspiration checked, by being exposed to a current of air, or sleeping exposed to the dews; costiveness, &c. &c. &c. In fact, whatever becomes an exciting cause of fever in any country, is

* What will Dr. Clutterbuck say to this?

equally so in this; but unfortunately it is not the same fever that is induced.

It has been observed, and very frequently urged by the *bon vivant*, as an excuse for his mode of life, that men who live in the most temperate manner, are as liable to fever, if not more so, than those who follow the opposite extreme. There is an appearance of truth in this remark. Often, very often, the temperate and sober are seized with this fever, under circumstances where the drunkard escapes.

A stranger, on his arrival in the country, unless possessed of more than ordinary resolution, is assailed by so many temptations, that he has not the power to follow the plan he may have laid down for his own regulation. He commits an *occasional* excess, and next morning awakes in a high fever; while the man accustomed to his "*musquito dose*," probably feels no uneasiness, or, if he has a slight head-ache from his last night's debauch, flies for relief to his hot punch or sangaree. The more temperate and regular a man has lived, any deviation will become, in a proportionate degree, a stronger exciting cause of fever.* But if the drunkard and the sober man should be attacked with fever, the former has not an equal chance of recovery with the latter.

Contagion, as a source of this fever, is entirely

* This is no argument against temperance; it only proves that its breach is more dangerous to the regular liver than to the debauchee.

rejected by those professional men who have the greatest opportunity of information, now resident in the West Indies. No case occurred, where the fever could be traced to a contagious source. In the very first stage of this fever, it would probably be difficult to distinguish it from the other continued fevers of the country. Its violence is one criterion, by which we might form a judgment. We must also look to the particular circumstances of the person attacked. —If he has been but a short time from Europe; —if he has been taken ill after a debauch—fatigue—or unusual exposure to the sun, or to a partial current of air, or after sleeping in the night air, there is much reason to apprehend yellow fever; more particularly if the eyes be inflamed, and the pain of the loins stretches forward to the navel; with soreness of the throat —heat, and acrid sensation in the stomach; a feeling of pressure there, and urgent desire for cold drink. These, and the other symptoms already described, will indicate the nature and the danger of the disease.

Bleeding largely, in the early stage of the fever, has been found of the most eminent service. When employed after the first stage of the fever had passed by, it did injury, and certainly hurried on dissolution. The following plan is that which has been pursued at this hospital, for several years; it is that which has been practised by many of the naval surgeons on this station, and has been attended [would I could say with uniformly the happiest effect!] with at least superior success to that of any other.

From twelve to twenty-four ounces of blood and upwards, are drawn from the arm, as soon after the accession of the fever as possible. The blood should be drawn until derangement of the vascular action has taken place, by the quantity of blood extracted; indicated by approaching syncope, nausea and vomiting. Should fainting come on, from mental emotion, such as the dread of the lancet, sight of the blood, &c. &c. the bleeding is to be continued after the patient has revived, until a quantity proportioned to the strength is drawn off. Six grains of calomel, and double that of cathartic extract, are to be immediately given; and if this medicine does not operate in three hours, it is to be repeated. At the end of six hours, if the purgative has not yet had effect, it is to be assisted by an enema; and either an ounce and a half of sulphas magnesiæ, vel sodæ, or half a drachm of jalap, with an equal quantity of cremor tartar, are to be given.

In eight hours after the patient has been blooded, six or eight full, copious evacuations should be procured.

During this time, if the skin be hot and dry, the cold affusion is to be employed every two hours. Partial perspiration, in the early stage of the fever, should not deter from its use. *The greater the force with which the water is applied, the more benefit is to be derived from it.* When there is much pain of the head, the hair is to be shaved off. Thus the treatment, during the first twenty-four or thirty-six hours, consists in one full, large bleeding—purgatives, so as to procure several copious alvine evacuations—the cold

affusion *—shaving the head; and the liberal use of barley-water, or any other weak drink.

Under this plan, fifty patients out of one hundred, attacked by the genuine endemic fever, will shew evident signs of amendment within the above-mentioned period. A general perspiration, not profuse, will break out; the heat of the skin will be reduced; head-ache, and pain of the thighs and legs will be abated; the red vessels in the white of the eye will disappear; the thirst will be lessened; and, in short, all the feelings of the patient will become more agreeable. From this state they recover with extraordinary rapidity. In one week they are restored to perfect health.

If this favourable change does not take place within the period alluded to, there is much danger. The patient becomes restless; the sensation of pain is more acute; delirium, vomiting, and other bad symptoms succeed. In this stage, the bowels are to be kept loose—two or three stools are to be procured every twenty-four hours, by calomel, given in four grain doses, three or four times a day, as the state of the bowels may indicate. The cold affusion is to be continued, lessening the force with which the water is applied, as the vascular action and heat diminish. If delirium and vomiting are present, blisters are to be applied to the head and nape of the neck. Before the heat is reduced, and the vascular action brought down to its natural standard, stimulants are employed;

* The vapour bath, now coming into use at the naval hospitals abroad, bids fair to prove a powerful auxiliary in soliciting the blood to the surface, and thus relieving the internal organs from the effects of CONGESTION.

such as wine, at first in small quantities, gradually increasing it; capsicum, in the form of pills. If the patient has been much addicted to spirits, toddy in lieu of wine is to be allowed; but the stimulant from which I have observed the greatest benefit, is the carbonate of ammonia, in doses of six or eight grains every two hours, with small doses of the nitrous æther, diluted with water. When vomiting is urgent, the patients are to be restrained from drinking much; and when the stomach is empty, more benefit is derived from two table spoonfuls of arrow-root every half hour, than from any medicine I have known. Vitriolic æther, and even ardent spirits, to restrain vomiting, as the heat and vascular motion subside, have been taken with partial relief.

This state may continue for two days, or even longer, before there is any remission. The first favourable symptom is usually a refreshing sleep, and the absence of delirium. A warm and moderate perspiration covers the surface; and if the skin and eyes have been yellow, the colour becomes more bright.

Convalescence from this stage of fever is much more slow than from the first. Much attention to the state of the bowels, and the liberal use of the decoction of bark, with vitriolic acid, if there be much oozing of blood from the gums and fauces, are necessary. From that stage in which the black vomit is the prominent symptom, few—very few recover. Dark-coloured fluids, however, have been often taken for black vomit, where the latter did not exist, and thus nurses, and even medical men, have been deceived. All the cases that recovered at this hospital, were certainly unex-

pected. This dreadful symptom had continued in all of them above twelve hours; oozings of blood from various parts, stools black as ink, &c. &c. were present. The first sign of amendment was the stomach becoming retentive, and the enjoyment of a few hours sleep. The yellow colour of the eyes and skin became daily brighter, till at last the patient had the most perfect jaundiced look; the colour of the stools keeping pace with that of the eyes and skin. The stimulating plan of treatment, after full and copious evacuations in the early stage of the disease, was gradually begun with these patients long before the vascular action had been reduced to its natural standard. Wine frequently, and in small quantities—the carbonate of ammonia—capsicum, with arrow root, were assiduously administered; and whenever the appetite of the patient craved for brisk porter, spruce beer, &c. they were never denied; but these and other drinks were given in small quantities at a time, as larger caused instant vomiting.

Relapses from this fever frequently terminate fatally. Want of appetite, and sensation of fulness at the stomach, usually precede the common train of symptoms. In these cases, I found an emetic give instantaneous relief. The patient generally vomits a large quantity of æruginous-coloured matter, and the evacuation is attended by immediate ease: two or three drachms of the tartarized antimonial wine (Edin. Phar.) are generally sufficient for the purpose. In the *usual* practice of the hospital, emetics are omitted, because they often delayed the exhibition of brisk purgatives, which are required to move the bowels in this fever. But there is one form of the endemic com-

mencing with diarrhœa, and sometimes dysenteric symptoms, in which emetics are employed with advantage. When the fever, however, commences in this way, it is less dangerous, though more protracted, than where costiveness and torpidity of the bowels attend.*

In this, as in other diseases, anomalous symptoms will occasionally occur, requiring slight modifications of treatment; but these can only be learnt at the bedside. On this account, I forbear to enumerate ladanum, æther, ginger-tea, effervescing draughts, champaigne, &c. which in high practice are sometimes prescribed. The practice of applying powdered capsicum to the raw surfaces of blistered parts, by way of counter-irritation, had nearly become fashionable from its novelty; but this barbarous practice, I believe, is nearly laid aside. I may mention, though out of place, that the actual degree of heat, as indicated by the thermometer, is not proportionate to the intensity communicated to the hand. The heat generally varied between 99° and 102°, very seldom exceeding 103°; yet the same imparted a burning caustic sensation to the hand at these times."

This ingenious and experienced physician does not suppose a residence in other hot climates to be any effectual security against the endemic of the

* "The most favourable cases of the yellow fever, are those "in which a bilious diarrhœa comes on; while the most "fatal are those in which the bowels are so torpid as to be "insensible to any stimulus, either from their own contents "or from medicine." Blane, 3d ed. p. 450.—Vide last section, page 209.

West Indies. Several regiments, which had been a considerable time at Gibraltar, and were afterwards sent to the West Indies, in 1795, were cut off, almost to a man, by the yellow fever; and ships from the Coast of Africa (for instance, the Arab in 1807) were depopulated with as much rapidity as if they had come from England. This proves what I have before remarked in the Batavian endemic, that nothing but being habituated to the *local* miasm, can secure us from the *local* fever, however theorists may generalise or identify the remote causes. He concludes with this observation: "It is probable that as many lives "have been lost by the *temerity* of men who have "resided in *other* hot climates, as by the *timidity* "of those direct from England."—This sentiment from *experience*, will outweigh a volume of eloquence from theory. He considers the climate as unfavourable to European constitutions, especially when they approach it after the age of puberty; though by proper prophylaxis, they might avoid or greatly mitigate the diseases of the country.

The following are his directions, as far as concerns the navy:—

"When a ship from England approaches the land, the crew should have their allowance of spirits diminished, and spruce beer, or other light beverage, substituted in lieu thereof; and on her arrival in port, the utmost vigilance should be used, to prevent the introduction of liquor by bum-boat women, or boats' crews. The surgeon should cause every individual in the ship, to take a purgative medicine once a fortnight or oftener, for the first twelve months. The men

should not be employed unnecessarily in the sun, for the first year after their arrival in the country; nor at any time be permitted to work exposed to his direct rays, between the hours of ten in the morning and two in the afternoon. The dockyard and watering duty should not be performed by any but those accustomed to the climate—a corps of blacks for that purpose, would save a great waste of lives. Ships should remain as short a time as possible in port; and between the months of July and December no ship should be permitted to refit, or stay more than a day or two in harbour, except in cases of absolute necessity. Where great repairs are wanting, the ships should be sent to Halifax, or even to England.

Government should so arrange the navy, that ships might not be kept more than twelve or eighteen months on that station; the seamen would then come to the West Indies with cheerfulness, and submit to privations without repining, when they knew the utmost limits of their sufferings. By these means the men would not remain long enough in the country to acquire a *predisposition to dysentery* and ulcers, which they inevitably do by a longer residence. Grog-shops in the vicinity of dock-yards should be prohibited by the interference of the colonial legislature. Cleanliness, dryness, and ventilation of the ship, as well as personal cleanliness, should be more particularly attended to than in Europe.

Finally, the refitment of ships should be more consigned to Carlisle Bay than Antigua Harbour. Probably there is no island in the West

Indies where there is a greater degree of health than in Barbadoes; and although Bridgetown and its neighbourhood is the most unhealthy part, yet I am so persuaded of its superior salubrity, that I would venture to assert, that five ships of the line, lying three months in Carlisle Bay, would not send a *sixth* part of the number of sick to the hospital, that would be sent, under similar circumstances, from an equal number of ships at Antigua."

HEPATITIS.

SEC. 6.—"The exclusive efficacy of mercury," says Dr. Saunders,* "in liver-diseases of the "continent of India, may perhaps be explained, "by supposing they arise from an *indigenous "and local poison, or miasma,* peculiar to that "country, unlike any thing known in any other "part of the world, even under similar latitudes "and temperatures."

Had this ingenious and deservedly eminent physician ever visited the continent alluded to, his penetration would have discovered the cause of this phenomenon, without the aid of an "indigenous poison," which, like the introduction of an epic divinity, is a more poetical than philosophical mode of extricating ourselves from difficulties, and *loosing* the gordian knot.

In order to clear the way for this investigation, it is necessary to inquire, whether this "endemic of India" be equally prevalent in all parts of that vast empire. Here universal evidence gives the negative; and every one, in the least acquainted with the medical topography of the country, knows, that genuine, or ideopathic hepatitis, is ten times more prevalent on the Coast of Coromandel than on the plains of Bengal; while, on the other hand, intermitting and remitting fevers are ten times more nume-

rous in the latter than in the former situation. Let us next see, if there be any particular difference in the climates and temperatures of these two places. By exact thermometrical observations made at Calcutta, by Mr. Trail, during a whole year, the following appears to be the monthly medium heat of three different diurnal periods—morning, noon, and evening.

TABLE.—No. I.*

January	66°	May	84°	September	82½°
February	74	June	83	October ..	82½
March	79	July	83	November	76
April	86	August	82	December..	68
Annual Average, 78½ Fahrenheit, 1785.					

Let us compare this with the heat at the presidency on the coast.—The following is copied from the Madras gazette, shewing the state of the thermometer at the Male Asylum, during one week in July 1804, which was by no means remarkable for any extraordinary range of temperature.—

* Vide 2d vol. Asiatic Researches.

TABLE.—No. II.

State of the Thermometer at the Male Asylum, Madras.

1804.		7 A.M.	Noon.	3 P.M.	8 P.M.	Average	Remarks.
July	11....	81	88	89	85	86	"The thermometer is placed in a room moderately exposed to the weather, and facing the north-west.
	12....	81	88	90	86	86¼	
	13....	81	91	92	86	87½	
	14....	82	90	93	84	87¼	
	15....	83	91	94	88	89	
	16....	84	92	95	91	90½	
	17....	85	94	96	91	91½	

Total Average, 88½.

Now it is well known, that, excepting for a few weeks at the change of the monsoon, in October and November, the Coromondel Coast is remarkable for a cloudless sky and steady temperature, all the year round;—the heat, however, being often above the specimen exhibited, as the following table from Dr. Clark will shew.

Hepatitis.

TABLE.—No. III.

State of the Thermometer on board the TALBOT *Indiaman, in Madras* Roads, *from the* 24th *July to the* 23d *August*, 1771.

Month.	Day.	Hour.	Ther.	Month.	Day.	Hour.	Ther.
July	24	12	90	August ..	8	7	96
		6	96		9	12	89
	25	12	88			4	87
	26	12	90		10	12	93
		3	93			4	88
	27	12	90		11	2	94
		3	93			4	89
	28	12	90		12	12	93
		3	92			4	90
	29	12	93		13	12	90
		4	96			4	87
	30	12	90		14	12	89
		4	91		15	12	89
	31	12	91			3	90
		4	93		16	12	90
August ..	1	12	93			4	94
		4	94		17	12	94
	2	12	92		18	12	93
	3	12	90		19	12	90
		3	91			4	87
	4	12	90		20	8	90
		4	92			3	94
	5	12	92		21	8	92
		4	94			3	95
	6	12	89		22	11	94
	7	12	90			4	87
		5	92		23	10	86
	8	12	93			3	88

Total Average, 91°.

Dr. Clark remarks that, "on account of the sandy soil at Madras, it was found moderate enough to allow a thermometer to rise six or seven degrees higher ashore." This would make the average, for a month in succession, 97 or 98°.—Vide Clark on Long Voyages, page 56 et seq. Mr. Curtis, speaking of the Coromandel coast, where he remained on shore more than a year, observes—"Except for two or three weeks about the shifting of the monsoons, especially that which happens in the month of October, a shower of rain, or a breeze of wind, are (is) almost unknown; scarce ever a haze or cloud appears upon the horizon, to mitigate the dazzling ardour of an almost vertical sun; and the thermometer, through *the whole twenty-four hours,* seldom or never points under 80° of Fahrenheit, but generally *far above it.*" Introd. p. xvii. How far above 80 it generally points, the preceding tables will clearly evince.

The nature of the soil is such, that while the sun is above the horizon, it acquires a much superior degree of temperature to that which the plains of Bengal attain; in consequence of which, the nights are often hotter than the days, when the land-winds prevail in May, June, and July. I have seen the thermometer stand at 105° of Fahrenheit, at *midnight;* and that too on board a ship riding at anchor in Masoolipatam Roads. Many causes combine to produce so much higher a range of atmospherical heat in the Carnatic than in Bengal. First, the coast in question trends away towards the equinoctial line, while a great part of Bengal lies *without*

the tropics. Secondly, the soil of the former is gravelly or sandy, and vegetation stunted; whereas that of the latter is clayey, aud vegetation luxuriant. Thirdly, the periodical rains that fall, at the change of the monsoon, on the coast, are instantly absorbed by the parched and sandy surface, affording only a very temporary coolness to the air; while an actual and extensive inundation covers Bengal for months together. If, therefore, the nocturnal temperatures of the two places were blended with the diurnal —if, for instance, the thermometer were marked every hour at Madras and Calcutta throughout the year, and the whole averaged, there would be full *ten degrees difference* in the annual mean temperatures of the two presidencies. Bombay is nearly on a par with Calcutta; for although the country surrounding the former is neither flat nor inundated, as in Bengal, yet its northern parallel of latitude, its insular situation, and the mountainous nature of the adjacent country, combine to render the average annual temperature of Bombay as low, if not lower, than that of Calcutta.*

An important, yet unnoticed circumstance, remains to be considered, in estimating the comparative influence and effects of the two climates.

Although *sudden* vicissitudes of temperature are highly injurious to the constitution, in general, and to the hepatic system in particular; yet

* Vide Dr. M'Gregor's Memoir, Edin. Med. and Surg. Journal.

an *annual* change is eminently beneficial. Thus, the first table shews us, that at Calcutta, during four months of the year, viz. November, December, January, and February, the average heat of the day is only 71° Fahrenheit, five degrees *below* the common summer heat of England. As for the nights, I can vouch for their being cooler than summer nights at home; since a hoar frost is not an unusual sight on the plains of Bengal, in the mornings of this period; and very gratifying have I found the heat of a blanket at Calcutta in the month of December.

Thus the Bengalese, and those in similar parallels of latitude, enjoy a kind of *tropical winter*, or exemption from high ranges of temperature, during *one-third* of the year; the effects of which, in relieving the hepatic system from excessive action,—in bracing the whole frame, relaxed by the previous heats, and preparing it to sustain the subsequent ones, may be compared to a short return to our native skies.

This remark will be confirmed by the following analogical observations of Dr. Darwin. "Though all *excesses* of increase and decrease of stimulus should be avoided, yet a certain *variation* of stimulus seems to prolong the excitability of the system: thus, those who are *uniformly habituated to much artificial heat*, as in warm parlours in the winter months, lose their irritability, and become feeble, like hot-house plants; but by frequently going for *a time* into the cold air, the sensorial power of irritability is accumulated, and they become stronger. Whence it may be deduced, that the *variations*

of the cold and heat of this climate (England) contribute to strengthen its inhabitants, who are more active and vigorous than those of either much warmer or much colder climates." —*Zoonomia.*

Knowing then, as we do, how uniformly a high temperature affects the biliary organs, and keeping the foregoing facts in view, can we be at a loss to account for the greater frequency of genuine hepatitis in the Carnatic, than in Bengal?—I say genuine, or original hepatitis; for most of those cases which we meet with at the latter place, are the consequences, or sequelæ, of repeated intermittents and remittents, both marsh and jungle.

The same reasoning applies to Bombay, and and all other parts of India, whose distance from the equator produces a *tropical winter*, when the sun is near Capricorn; or where peculiarity of soil, elevated situation, or other locality, is incompatible with that high, and almost unremitting range of temperature, so remarkable on the Coromandel coast, and so fully adequate to the derangement of the hepatic functions.

Having thus explained, in I trust a satisfactory manner, the nature of this "local poison," and how it comes to operate more forcibly in one part than another of the Indian continent, it is necessary to shew why, even in the less sultry parts of the latter—for instance, Bengal, the complaint is still more prevalent than under similar latitudes in the West.

Dr. Saunders quotes, in support of his hypothesis, the following observation from Hunter on the Diseases of Jamaica. "It is a remark-

" able thing," says the latter, " that in the East " Indies, under the same latitude *nearly* as Ja- " maica, that is, at *Madras and Bombay*, the " disease known in those countries by the name " of Liver, or Hepatitis, shall be the most pre- " vailing disorder among Europeans, and that " the same should not be known in the Island " of Jamaica." In the first place, there is a geographical error in classing Madras and Bombay in similar latitudes. In the second place, I assert, that there is a difference of ten degrees in the annual mean temperatures of the two places, taking the *hourly average height of the mercury, by day and by night, throughout the year*. In the third place, hepatitis is by no means the most prevailing disease among Europeans at Bombay; dysentery being infinitely more common.* But further, the Island of Jamaica, from its situation in the vicinity of Cancer, must have its " tropical winter," as well as Bengal, and at the same period; while its insular nature, and distance from the American continent, insure it the advantage of sea and land breezes,—the *former* coming in *cool* and refreshing, in every direction, from the sea by day; the latter descending *cold* from the blue mountains by night.

On the contrary, in Bengal, the land-winds are so distressing in April and May, as to oblige

* If I afterwards trace a connection between dysentery and deranged hepatic function, it will not invalidate this position; as the same observation will apply to the dysenteries of the West.

the Europeans to sit behind tatties, for weeks together, to avoid being stifled with heat and dust. It is far otherwise in the West. Indeed it is computed by Dr. Mitchell, after thirty years observation, that it is as hot in the countries of the old continent, in latitude 29 or 30, as in the countries of the new continent which lie in 15 degrees of latitude. M. de Paw makes the difference between the old and new continents, in respect to temperature, amount to 12° of the thermometer.—Recherches Philosophiques.

"The vernal season in these parts," [West Indies] says Mr. Edwards, "may be said to commence with May. The parched Savannahs now change their aspect, from a withered brown to a fresh and delightful green. Gentle southern showers presently set in, which, falling about noon, occasion bright and rapid vegetation. At this period, the medium height of the thermometer is 75°. After these vernal showers have continued about a fortnight, the season advances to maturity, and the *tropical summer* burns in its full glory. During some hours in the morning, before the sea-breeze has set in, the blaze of the sun is fierce and intolerable. But as soon as this agreeable wind arises, the extreme warmth is abated, and the climate becomes even *pleasant* in the shade. The thermometer now stands generally 75° at sunrise and 85° at noon.*

* Compare this with table No. 11.—85° in the morning, 96° at noon.